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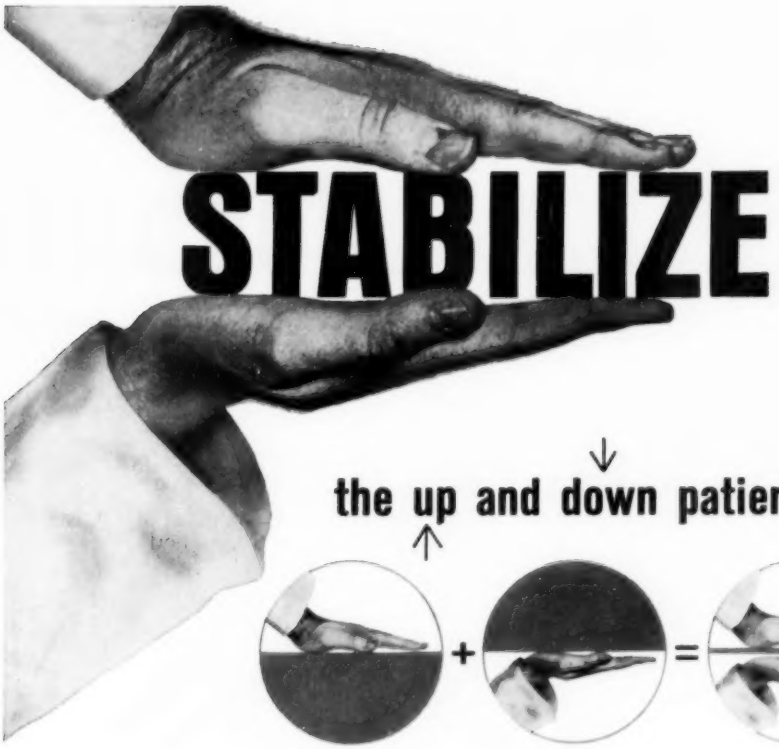

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1. Arnoff, B.: Personal communication. 2. Lazarte, J. A., and Petersen, M.C.: Personal communication.

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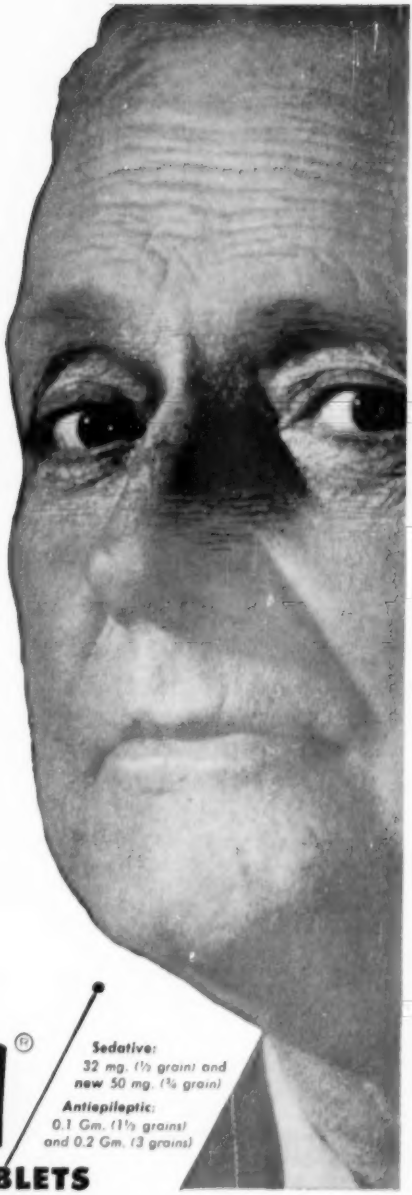

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2. *Thompson, Lloyd & Proctor, Rich.* N.C. State, *Dec. '54*
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1. Hollister, L. E., Krieger, G. E., Kringel, A., and Roberts, R. H.: Ann. New York Acad. Sc. *61*:92 (April 15) 1955. 2. Hoffman, J. L., and Konchegul, L.: Ann. New York Acad. Sc. *61*:144 (April 15) 1955. 3. Kline, N. S., and Stanley, A. M.: Ann. New York Acad. Sc. *61*:85 (April 15) 1955.

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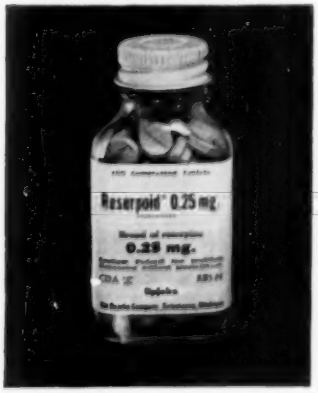

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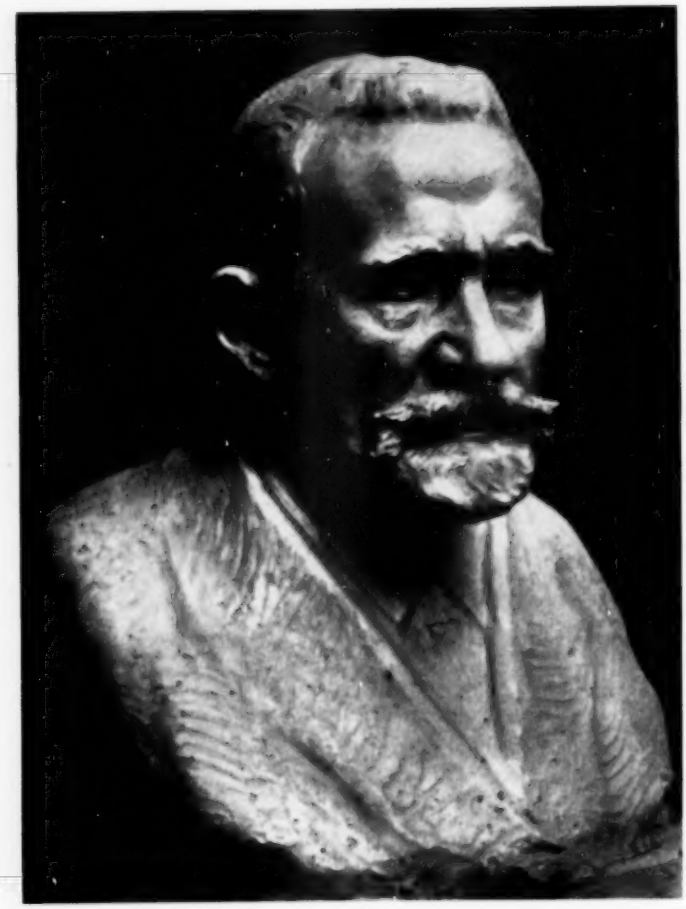

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EMIL KRAEPELIN

FEBRUARY 15, 1856–OCTOBER 7, 1926—FEBRUARY 15, 1956

EUGEN KAHN,[1] HOUSTON, TEXAS

Emil Kraepelin died 30 years ago. The influence of his work in psychiatry continues; it may be greater than we are aware of, particularly in view of the recent efforts biologically and physiologically to get closer to the solution of many of our problems. It is appropriate to spend a little time with this master in the very year in which in several places his one-hundredth birthday was remembered.

I

Kraepelin was 18 years old when he began to study medicine in 1874. He received his degree in 1878. He attended a psychological summer course in 1877 under Wilhelm Wundt (1832-1920) in Leipzig. In addition to his medical studies he functioned (1877-78) as assistant to Franz Rinecker who at that time was professor in the medical faculty of the University of Wuerzburg and in charge of the psychiatric and dermatological clinics of the Julius-Spital. He wrote a dissertation in 1877 "Concerning the Influence of Acute Diseases on the Causation of Mental Illness"; here the influence of Wundt is already obvious. Kraepelin writes and elaborates:

> The most important achievement which the advance of scientific research has brought to psychiatry in our century is the firm foundation of the notion of the somatic basis of mental disorders.[2]

Kraepelin remained faithful to Wundt, his most revered teacher, and to his teaching throughout his life. He introduced physiological psychology into psychiatry and made a goodly number of contributions to it. In his obituary on Wundt he wrote (1920):

> We felt we were pioneers in a new land, creators of a science of unforeseeable possibilities.

He refers to several of the older psychiatrists, whose views did not permit a mutual understanding, and says:

> If we have conquered these difficulties which paralyze progress and if we are able to get together on common ground at least in psychology, we have been able to do so through Wundt's physiological psychology.[3]

Against the wish of the then ordinarius, Flechsig, Kraepelin became a *Privat Dozent* in the medical faculty in Leipzig with the support of Wundt in 1882. He worked in Wundt's department on psycho-pharmacological problems in 1883. During this earliest period of his scientific production Kraepelin wrote several shorter papers, a brochure, and a book. The brochure is "The Abolition of the Determinate Sentence"; the book the *Compendium of Psychiatry.*

In the brochure the young alienist (Irrenarzt) made "a proposition for the reform of modern criminal law." Capital and corporal punishment must be eliminated. But the sentences which send law-breakers for a measured and determinate time to penitentiary or jail are useless too. If criminal law is to have any real sense and purpose it is the protection of society and the betterment, if possible the rehabilitation, of the law-breaker. Kraepelin discusses the problem thoroughly and makes practical suggestions as to how to proceed without any "elegiac

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[1] From the Department of Psychiatry, Baylor University College of Medicine, Houston, Texas.

[2] *Arch. Psychiat. & Nervenkrankh.*, XI, XII, "Die wichtigste Errungenschaft, welche der Aufschwung naturwissenschaftlicher Forschung in unserem Jahrhundert der Psychiatrie gebracht hat, ist die feste Begruendung des Satzes von der somatischen Basis der Geistesstoerungen."

[3] *Zschr. f. d. ges. Neur. & Psychiat.*, LXI, 1920, "Wir fuehlten uns als Pioniere im Neuland, als die Schoepfer einer Wissenschaft mit ungeahnten Aussichten." "Wenn wir diese, allen Fortschritt laehmenden Schwierigkeiten heute in der Hauptsache ueberwunden haben und uns wenigstens in der Psychologie wieder auf gemeinsamem Boden zusammenfinden koennen, so ist das im Wesentlichen erreicht worden durch Wundts physiologische Psychologie."

and morbid humanitarianism."[4] Kraepelin's scientific orientation is clearly expressed, *e.g.*, as follows:

If the notion of immorality that originated from the transcendental point of view is transformed into the notion of dangerousness to the community, punishment can no longer be atonement for a committed crime; punishment then will no longer deter from the breaking of existing laws for these laws' own sake, but it will mean only the reaction of human society against those who imperil its life and its happiness.[5]

Only a few months ago Gruhle observed "that one might wish that a new edition of this paper would be published every five years."[6]

The scientific view is still more obvious in the *Compendium*:[7]

The psychological manifestations are nothing but "functions" of the brain; psychiatric disorders are diffuse diseases of the brain cortex. . . . Psychiatry is a particularly developed branch of neuropathology.

Kraepelin always maintained his interest in pathology; men like Alzheimer, Brodmann, Nissl, Spielmeyer had their laboratories in his clinic.

In the *Compendium* Kraepelin stresses that:

Psychiatry . . . belongs to the medical sciences and uses, as they do, in its investigations the methods of natural scientific research. . . . The definition and circumscription of separate forms of disease is the next task of a special pathology of the mental disorders. . . . What we are dealing with now are not diseases, but symptom complexes. A deeper pathological foundation of these symptom complexes will become available only if it will be possible to give evidence of their regular dependence on particular disturbances of the brain function.

II

The *Compendium* is the first edition of one of Kraepelin's life works, his *Psychiatrie*. It is a small book of 384 pages; the last completed edition, the eighth, of *Psychiatrie* consists of 4 volumes with altogether 3,048 pages. The eighth edition was published from 1909 to 1915. Of the ninth edition only the second volume was edited by Kraepelin; the first volume—general psychiatry—was taken over by Johannes Lange. Kraepelin worked on the introduction to the second volume, which was the last to appear, on his deathbed.

The preface in the second volume of the eighth edition begins:[8]

The fermenting movement in clinical psychiatry, shown in the rapid increase of literature, makes the textbook-like presentation of our science more and more difficult. Everywhere doubts and new problems are to be met. In few points only monographs are available that allow one to reach a somewhat clear viewpoint without investigations of one's own. This uncertainty which should be considered a sign

[4] "elegischen und krankhaften Humanismus" (Kraepelin).

[5] Die Abschaffung des Strafmasses. Ein Vorschlag zur Reform der heutigen Strafrechtspflege. (Enke-Stuttgart, 1880.) "Wenn der Begriff der Unsittlichkeit, wie er der transcendentalen Anschauung entsprungen ist, umgebildet wird in denjenigen der Gemeinschaedlichkeit, so wird auch die Strafe nicht mehr die Suehne des begangenen Verbrechens sein koennen, sie wird nicht mehr von der Verletzung der bestehenden Gebote um jener selbst willen abschrecken wollen, sondern sie bedeutet nichts mehr und nichts weniger, als die Reaktion der menschlichen Gesellschaft gegen die Excedenten, welche ihren Bestand und ihre Gluecksseligkeit gefaehrden."

[6] Emil Kraepelin's 100. Geburtstag. *Nervenarzt*, June 20, 1956.

[7] *Compendium der Psychiatrie.* (Abel-Leipzig, 1883). "Die psychischen Erscheinungen sind nichts als 'Funktionen' des Gehirns; psychische Stoerungen sind diffuse Erkrankungen der Hirnrinde. . . . Die Psychiatrie ist demnach nur ein besonders entwickelter Zweig der Neuropathologie. . . . Psychiatrie gehoert dem Kreise der aerztlichen Wissenschaften an und bedient sich wie diese letzteren der Huelfsmittel und Methoden naturwissenschaftlicher Forschung. . . . Die naechste Aufgabe einer speziellen Pathologie der Geistesstoerungen bildet die Definierung und Umgrenzung einzelner Krankheitsformen. . . . Was es [the then classification] bietet, sind nicht etwa Krankheiten, sondern Symptomenkomplexe. Eine tiefere pathologische Begruendung werden diese letzteren erst gewinnen, wenn es gelingt, ihre gesetzmaessigen Abhaengigkeiten von krankhaften Stoerungen der Hirnfunktionen im Einzelnen nachzuweisen."

[8] (Barth-Leipzig, 1910.) "Die gaerende Bewegung in der klinischen Psychiatrie, wie sie uns in dem raschen Anwachsen der Literatur entgegentritt, gestaltet die lehrbuchmaessige Darstellung unserer Wissenschaft fortschreitend schwieriger. Auf Schritt und Tritt tauchen Zweifel und neue Fragestellungen auf, und nur an wenigen Punkten ist der Boden durch Monographien so weit vorbereitet, dass es moeglich erscheint, ohne umfassende eigene Untersuchungen einen einigermassen klaren Standpunkt zu gewinnen. Diese Unsicherheit, die an sich gewiss als ein Zeichen des Fortschritts gegenueber der frueheren naiven Einfachheit unserer klinischen Anschauungen zu betrachten ist, hat die Neubearbeitung des vorliegenden Buches erheblich verzoegert."

of progress beyond the former naïve simplicity of our clinical views greatly delayed the new edition of this book.

From the same volume, the first sentence of the section on the classification of mental disorders is quoted because of its similarity with and difference from the sentence "The definition and circumscription. . . ." quoted above from the *Compendium:*

The circumscription of separate forms of disease and their grouping according to unitary characteristics is the next task of a clinical study of mental disorders.[9]

From the time of the publication of the *Compendium* until Kraepelin's death passed more than 40 years of incessant and intensive work, during which Kraepelin established himself as the master builder of psychiatry. Again and again he worked through thousands of cases of his own experience. He never tired in his attempts to group and regroup his material. In the fifth edition of the *Psychiatrie,* published 1896, he wrote:[10]

In the development of this book this edition signifies the last step from the symptomatic to the clinical view of mental disease.

Here we find in one category the "deteriorating processes" (dementia praecox, catatonias, dementia paranoids). Here there are "constitutional mental disorders" (periodic insanity, paranoia).[11] In the next edition (1899), and in the seventh (1904), dementia praecox, manic-depressive psychosis and paranoia (*Verrueckheit*)[12] are clearly distinguished as *Krankheitsformen* (forms of disease). Kraepelin uses the term "disease entity" (*Krankheitseinheit*) rarely, if at all. He speaks of disease forms, of unitary disease forms, or disease processes.[13]

In the eighth edition (1909-15) "The endogenous deteriorations" are subdivided into dementia praecox and paraphrenia.[14] The manic-depressive psychosis and paranoia are planned as forms of their own in the introduction to the ninth edition. It is fascinating to follow Kraepelin's attempt to do justice to his growing clinical material. For years the paranoid disturbances occupied his mind particularly. He tentatively took the paraphrenias out of the dementia praecox category, but he did not give up the paranoia as a group of its own. He occasionally used the term schizophrenia, which Eugen Bleuler coined. A few quotations from the eighth edition are in order:

The possibility that a certain number of cases of dementia praecox heals completely and permanently cannot be argued. . . . Today we cannot decide beyond any doubt that dementia praecox as circumscribed here represents a unitary disease.

The vast majority of the cases comprehended as dementia praecox are very likely due to the same disease process. . . . The survey of a large number of observations shows that there is not found any picture which would not be connected with all the others through most subtle transitions.[15]

Concerning the manic-depressive psychosis we read in the same volume:

In the course of the years I became more and more convinced that all the pictures mentioned are but manifestations of *one* disease process. It is possible that later a number of subgroups will be formed or that even small groups will be split off. If this were to happen, those symptoms which we have been accustomed to place in the foreground would, I conjecture, no longer be the decisive ones.[16]

[9] *Ibid.:* "Die naechste Aufgabe einer klinischen Betrachtung der Geistestoerungen ist die Umgrenzung einzelner Krankheitsformen und deren Gruppierung nach einheitlichen Gesichtspunkten."

[10] "In der Entwicklung des vorliegenden Buches bedeutet die jetzige Bearbeitung den letzten entscheidenden Schritt von der symptomatischen zur klinischen Betrachtungsweise des Irreseins."

[11] "Verbloedungsprozesse (Dementia praecox, Katatonien, dementia paranoides)"—"Konstitutionelle Geistesstoerungen (periodisches Irresein, Verruecktheit)."

[12] "Dementia praecox, manisch-depressives Irresein, Paranoia."

[13] Krankheitsformen, einheitliche Krankheitsformen, Krankheitsprozesse, klinische Einheit.

[14] See footnote 11. "Die endogenen verbloedungen"—Dementia praecox und Paraphrenie.

[15] ". . . . . die Moeglichkeit [ist] nicht [zu] bestreiten, dass eine gewisse Anzahl von Faellen der Dementia praecox zu voelliger, dauernder Heilung gelangt. . . . Ob die Dementia praecox in dem hier umgrenzten Umfange eine einheitliche Krankheit darstellt, laesst sich heute nicht mit Sicherheit entscheiden. . . . dass wir mit grosser Wahrscheinlichkeit die Hauptmasse der bisher unter der Bezeichnung der Dementia praecox zusammengefassten Faelle auf den gleichen Krankheitsvorgang zurueckzufuehren berechtigt sind. . . . Dennoch . . . lehrt der Ueberblick ueber eine grosse Zahl vollstaendiger Beobachtungen, dass sich nirgends ein Bild auffinden laesst, welches nicht durch unmerkliche Uebergaenge mit allen uebrigen verbunden waere."

[16] *Ibid.:* "Im Laufe der Jahre habe ich mich mehr und mehr davon ueberzeugt, dass alle die genannten Bilder nur Erscheinungsformen eines

We observed that all the disease forms which are here comprehended as a clinical entity can merge into one another, and can in the same case alternate and replace each other. This observation is perhaps more important than the derivation of syndromes from certain basic disturbances.[17]

Kraepelin underlines the good prognosis of the manic-depressive phases even if patients are suffering from them repeatedly. But he knows the doubtful prognosis of long drawn-out phases

If there occurs an accumulation of attacks . . . presumably also in very grave attacks which last for many years and in later life, the more or less serious danger of psychic invalidism exists.[18]

These quotations are made to allude to a variety of allegedly new discoveries which might have been considerably facilitated if the discoverers had looked up what Kraepelin had to say about the pertinent problems.

In this context I want to mention that after the publication of Kraepelin's *Die Erscheinungsformen des Irreseins* (1920) many psychiatrists assumed that he had capitulated to the claim of Hoche, a brilliant psychiatric sceptic, who thought that the very best that could be achieved in clinical psychiatry would be the formulation and definition of syndromes. These critics obviously did not bother to study "Die Erscheinungsformen" where syndromes are by no means the final goal. This paper ends as follows:

The vistas due to such a view are encouraging despite our present scanty knowledge. They might contribute to making easier our main task, which is so immensely difficult, *viz.*, the clinical understanding of the forms of disease.[19]

Kraepelin wrote (1916) in the preface to the third edition of his *Einfuehrung in die psychiatrische Klinik* (Introduction to Clinical Psychiatry):

The beginner is confused through the difficulty to distinguish syndromes and forms of disease. Therefore I discuss the interpretation of the most frequent manifestations of insanity in the third part of this book.[20]

In the first part of the book he reports and discusses cases which "in their brevity are not to be considered as scientific documents." In the second part he presents "The clinical forms of insanity" with the classification. The third part is titled "Syndromes and Forms of Disease."[21] Here he teaches:

Almost never is one symptom, but always only the total clinical picture, valid for the correct interpretation. This is the first principle.[22]

Kahlbaum was the first who demonstrated sharply the difference between the syndromes which are easily recognized and the disease processes which are concealed behind them.[23]

Here, too, it is obvious that the syndromes are only a means to get closer to the disease processes which remains the goal of Kraepelin's clinical psychiatry. He expresses this again and again in *Psychiatrie*, in *Einfuehrung*, and in a number of papers. He writes, *e.g.*:

Today a diagnosis signifies for us the recognition

einzigen Krankheitsvorganges darstellen. Moeglich ist es freilich, dass sich spaeterhin eine Reihe von Unterformen wieder ganz werden abspalten lassen; wenn das aber geschieht, so werden dabei nach meiner Ansicht ganz gewiss nicht diejenigen Zeichen massgebend sein duerfen, die man bis dahin in den Vordergrund zu stellen epflegte."

[17] *Ibid.*: "Von vielleicht noch groesserer Bedeutung, als der Aufbau der Zustandsbilder aus bestimmten Grundstoerungen, ist die Erfahrung, dass alle hier zu einer klinischen Einheit zusammengefassten Krankheitsformen nicht nur ohne erkennbare Grenzen ineinander uebergehen, sondern dass sie auch in einem und demselben Krankheits falle einander vertreten und ablösen koennen."

[18] "Dagegen besteht bei einer Haeufung der Anfaelle, unter Umstaenden wohl auch bei sehr schweren, sich ueber viele Jahre erstreckenden Einzelanfaellen und in hoeherem Alter, die mehr oder weniger grosse Gefahr eines psychischen Siechtums."

[19] *Zschr. ges. Psychiat. & Neurol.*, LXII, 1920: "Die Ausblicke, die eine derartige Betrachtungweise gewaehrt, scheinen mir tortz der Kuemmerlichkeit unseres heutigen Wissens ermutigende zu sein; sie koennten mit dazu breitragen, uns unsere so unendlich schwere Hauptaufgabe, das klinische Verstaendnis der Krankheitsformen, zu erleichtern."

[20] "Die namentlich den Beginner verwirrende Schwierigkeit, Zustandsbilder und Krankheitsformen auseinanderzuhalten, hat mich weiterhin veranlasst, in einem dritten Abschnitte die Deutung der haeufigsten Erscheinungsformen des Irreseins zu besprechen."

[21] "Zustandsbilder und Krankheitsformen."

[22] Einfuehrung: "Als oberster Grundsatz ist dabei festzuhalten, dass so gut wie niemals ein einzelnes Zeichen, sondern immer nur das klinische Gesamtbild fuer die richtige Deutung massgebend ist."

[23] *Ibid.*: "Den Unterschied zwischen den ohne weiteres erkennbaren Zustandsbildern und den hinter ihnen verborgenen Krankheitsvorgaengen hat zuerst Kahlbaum mit aller Schaerfe hervorgehoben."

of a disease process as the basis of the syndrome presented by the patient.[24]

His endeavor to come to a valid clinical classification is permeated by the idea that there are certain basic disease processes which the clinician gets hold of and which can sooner or later be verified by auxiliary sciences. The disease process is presumably due to a certain etiology. Johannes Lange has formulated this notion concisely:

All attempts at clinical classification aim at the search for the disease process.[25]

Lange comes to this statement after enumerating the points necessary to assume a "disease entity," *viz.*, "unitary causes, unitary symptoms, unitary course, unitary ending." [26]

Kraepelin never renounced the goal of all his clinical work: a classification, a grouping of "real" forms of disease. He never assumed that his nosological groupings would stand for ever, but he realized that his work had opened a new era in clinical psychiatry.

III

Kraepelin seemed to carry out a mission in psychiatry. If he had created only the manic-depressive psychosis and the dementia praecox he would have done more for psychiatry than the vast majority of psychiatrists ever did. But he did much more, not only for psychiatry, but for experimental psychology and "indirectly" for the sciences which in cooperation with psychiatry are auxiliaries. Kraepelin established laboratories of psychology, pathology, serology, and chemistry in his clinic; he gave genealogy a chance. Within his mission he achieved another of his great works: his research institute, the first one in psychiatry. His scientific convictions were visible in this as in his other undertakings. His interest in pathological anatomy may have been awakened by the third of his teachers, Bernhard von Gudden, on whose staff in Munich he served 1879 to 1883. von Gudden perished with the schizophrenic King Ludwig II of Bavaria in 1886. At this time Kraepelin was already professor in Dorpat; in his obituary on von Gudden, Kraepelin stated that his teacher's ideal was:

The unconcealed, undiluted and undimmed cognition of reality.[27]

In this paper and in papers he wrote about von Rinecker and Wundt we get glimpses into the man Kraepelin and into his aspirations and ideals.

He knew his value but he never overestimated himself; he was, indeed, a modest man. His modesty is often manifested in his respect for "facts"; it also shows when he opens a new field, as he did, *e.g.*, in comparative psychiatry, or when he discussed social problems.

Kraepelin was a simple man of unsophisticated tastes. In certain ways he was outrightly naïve. His way of living was almost frugal, but he enjoyed life, loving his family, loving nature, and loving his work. He appeared to be shy; he was not a man of the world. However, his shyness was more apparent than real since he had the desire not to lose any time with "nonsense," with formalities, with the obligations of social life. He was not a gregarious person. He despised every sort of kudos and took Johannes Lange to task because he had written a congratulatory article when the chief celebrated or rather did not care to celebrate his seventieth birthday.[28]

He was an impressive but not an eloquent speaker. He often remarked that it was a misfortune for a person to be a good speaker since this led too easily away from the "facts" into speculation and twaddle. His writing is admirable in its simplicity. Read a few pages of Kraepelin and compare them

[24] "Eine Diagnose bedeutet heute fuer uns die Erkennung eines dem gegebenen Zustandsbilde zugrunde liegenden Krankheitsvorgang bestimmter Art."

[25] Die endogenen und reactiven Gemuetserkrankungen und die manisch-depressive Konstitution. *Handb. d. Psychiat.* ed. by Oswald Bumke, Vol. VI. Springer-Berlin, 1928. "Der Erforschung des Krankheitsvorganges dient alle klinische Ordungsarbeit.

[26] *Ibid.*: "Krankheitseinheit"—"einheitliche Ursachen, einheitliche Symptomgestaltung, einheitlicher Verlauf, einheitlicher Ausgang."

[27] Muench. Med. Wochschr., 1886: "die unverhuellte, unvermischte und ungetruebte Erkenntnis des Wirklichen."

[28] Emil Kraepelin zu seinem 70. Geburtstage. *Ibid.*, Feb. 12, 1926, and Emil Kraepelin †, *Ibid.*, Oct. 26, 1926.

with the bombast we are offered nowadays in some quarters.

Kraepelin wrote a number of poems which are irrelevant. But what he has to say about poems is characteristic of him:

I never read poems although I composed some myself occasionally. I had the feeling that a poem is only for the writer himself in order to keep a valuable mood in his memory.[29]

Kraepelin was a great teacher. Three times weekly he held clinical lectures for 2 hours, for one and three-quarter hours to be exact, twice for beginners, once for advanced students. These clinics for which the professor prepared himself scrupulously were classics. In the advanced lectures and later in occasional presentations in the research institute one might have the opportunity to experience how Kraepelin worked, even wrestled, with his material, once in a while shaping it with sparing motions of his expressive hands reminding one of a sculptor at work.

He never tired of telling us that our science was only beginning. He taught us not to overestimate our findings. Anything might be ephemeral. Any step might be undone through new "facts"; yet the step was not in vain as it was inevitable on the endless road to better, but never complete, knowledge. What he said about Wundt can well be said about Kraepelin himself:

He continues to have influence wherever accuracy and carefulness in details are combined with the striving for wide and comprehensive vistas.[30]

[29] "Gedichte las ich grundsaetzlich nicht, auch als ich selber gelegentlich solche verfasste. Ich hatte das Gefuehl, als ob ein Gedicht nur fuer den Verfasser da sei, um ihm die Erinnerung an irgend eine wertvolle Stimmung festzuhalten" (from an autobiography).

[30] See footnote 3: "Er wirkt weiter ueberall dort, wo Treue und Sorgsamkeit im kleinen sich mit dem Streben nach weit umfassenden Ausblicken verbindet."

PHEOCHROMOCYTOMA AND ELECTROCONVULSIVE THERAPY

Case Report

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Pheochromocytomas are rare tumors arising in the chromaffin tissue of the adrenal medulla or the paraganglia of the sympathetic nervous system(1, 2). About 90% of them are found in the adrenal medulla. The remaining 10% occur in the lumbar or thoracic paravertebral spaces, in and about the great vessels of the abdomen, in the organ of Zuckerkandl at the bifurcation of the aorta, in the celiac ganglion and even within the cranial cavity(3). About 10% of the adrenal tumors occur bilaterally. Eight percent of all pheochromocytomas are malignant(4).

The diagnosis of phechromocytoma was made only at autopsy for 30 years after the condition was first described by Frankel in 1886(5). Since then over 300 cases have been reported in the literature. It is rarely if ever diagnosed clinically except when suspected because of associated paroxysmal hypertension or sustained hypertension. Pincoffs and Shipley, in 1929, were the first to report a correct preoperative diagnosis and successful surgical removal of a pheochromocytoma with paroxysmal hypertension(6).

Marriott(7) summarized the diagnosis of this tumor as follows:

> Pheochromocytoma must be especially suspected clinically (1) if hypertension is present in a young person: if it first makes its appearance during pregnancy or the puerperium; or if a hyertensive crisis is precipitated by anesthesia, surgery, or other trauma; (2) if the hypertensive patient has "attacks" or "spells" characterized by headaches, palpitation, tachycardia or bradycardia, precordial or abdominal pain, pallor or flushing, nausea, vomiting, blanching of the extremities, profuse sweating, blindness, aphasia or loss of consciousness; or (3) if the hypertension is associated with elevated BMR or other symptoms suggestive of hyerthyroidism, glycosuria, or hyperglycemia. It is of interest that a familial incidence in pheochromocytomas has been noted. Fourteen percent of all pheochromocytomas are palpable. Cautious, gentle massage over the upper abdominal quadrants may cause a diagnostic rise in blood pressure; if the maneuver is undertaken, phentolamine must be available for immediate intravenous injection to forestall the development of a dangerous hypertensive crisis.
>
> Pheochromocytoma may be referred to as the "great mimic." Because of the many symptoms common to both—tachycardia, heat intolerance, palpitation, loss of weight, increased appetite, flushing, sweating, nervousness, tremor, glycosuria, increased BMR—pheochromocytoma may readily be confused with hyperthyroidism. To confound this confusion, pheochromocytomas may also cause swelling of the thyroid, exophthalmos, increase in protein-bound iodine and a temporary response of the BMR to antithyroid drugs. It is calculated that about 10% of patients with pheochromocytoma are being treated for diabetes mellitus at the time the correct diagnosis is made. The easy confusion with essential hypertension has been referred to above. Other conditions which have been mistakenly diagnosed are glomerulonephritis, and other renal lesions, toxemia of pregnancy, eclampsia, and psychoneurosis. Pheochromocytoma has masqueraded as gastrointestinal hemorrhage and abdominal emergency, and in reverse, has been mimicked by such oddities as coarctation of the abdominal aorta and renal cyst. It is thus clear that the responsibility of suspecting the diagnosis of pheochromocytoma may fall not only on the internist and cardiologist but also at times on the endocrinologist, dermatologist, neurologist, pediatrician, psychitrist, ophthalmologist, abdominal or general surgeon, or urologist.

The following symptoms and signs of pheochromocytoma have been described and emphasized by other clinicians:

(1) Palpitation at night(8).

(2) Analysis of 18 cases: The average hypertensive attack lasted 1 to 2 hours. In 5 cases the attack lasted only from 3 to 20 minutes. The attacks tended to occur more often early in the morning, either before or after breakfast, but also appeared "in bed at night, or often after meals." Between hypertensive attacks the pupils may be widely dilated. The attacks may be heralded by palpitation, nausea, anginoid feelings, roaring in the head or by occipital headache. In most of the 18 cases severe pain invariably accompanied an attack—precordial in 2, epi-

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gastric in 7, leg cramps followed by abdominal distress and then "terrific headache" in 1, "severe binding headache" in 1, lower abdominal and lower lumbar pain in 1, and pain in the fingers and toes. Headache occurred in 10 cases—described "severe occiptal" in 3, "as if the head were going to burst" in 1, "sense of pressure on top of the head and vertical headache" in 1, and "severe and binding" in one. Vomiting occurred during attacks in 13 cases, but an additional 3 patients suffered from nausea alone. Obvious sweating occurred in 14 cases, either during or at the end of an attack of paroxysmal hypertension. The blood pressure rose paroxysmally in all 18 patients. The EKG of 5 patients showed very high T waves as in hyperthyroidism, of a type which might also be expected from an overdose of epinephrine. Following hypertensive attacks, extreme fatigue and prostration lasting from a few minutes to all day occurred in 10 cases(6).

(3) Sporadic elevated body temperature of 1 degree or more is characteristic of patients with pheochromocytomas(1).

(4) Patients with this tumor have sudden attacks of severe headache, anxiety, nervousness, palpitation, substernal pressure or pain, followed by exhaustion and profuse sweating(5).

(5) Smithwick and his associates found 5 unsuspected cases among a group of 1,000 patients subjected to sympathectomy and adrenal exploration for hypertension(9).

(6) Pheochromocytoma is diagnosed only at autopsy in about 70% of reported cases(3).

(7) Classic paroxysms of "adrenosympathetic crisis" may be precipitated by such events as emotional upsets, physical exertion or changes in posture, gargling (in 1 case), or (in 1 case) by the drinking of a liter of water for a renal dilution test. Sudden death may occur from pulmonary edema, ventricular fibrillation, or cerebral hemorrhage. Hyperglycemia and glycosuria during attacks are common(2, 6).

The diagnosis of pheochromocytoma is still considered difficult and intricate(8). The more common diagnostic aids are a plain roentgenogram of the abdomen and an intravenous pyelogram(6). One author reported a normal intravenous pyelogram in 10 of 11 proven cases(1). Palpating deeply for the tumor may send the patient into a fatal "adrenosympathetic crisis" because such pressure may squeeze out tremendous amounts of epinephrine and nor-epinephrine into the blood stream(10). Perirenal or presacral insufflation of oxygen has been employed to outline a tumor mass(2).

Certain pharmacologic tests have been of considerable aid in the diagnosis of this tumor. One method is the determination of the total amount of nor-adrenaline and adrenaline in the urine(8, 10). Another fairly accurate method is to produce a paroxysm of hypertension with histamine phosphate or mecholyl. Regitine (phentolamine), when given intravenously in proper dosage, causes a fall in blood pressure which is often considered of some diagnostic importance. Benzodioxane (piperoxanhydrochloride) has a similar antipressor action(2, 9).

Surgical excision of the tumor is the only possibly effective method of cure, and, when successful, may result in a complete remission of symptoms, unless the hypertension has been persistent and of long duration. The death rate associated with the surgical removal of these tumors has been high, as the blood pressure may rise to extreme heights or fatal cardiac arrhythmias may occur due to excessive discharge of medullary hormones. In addition, following removal of the tumor, the blood pressure may fall precipitously and profound and rapidly fatal shock may ensue due to abrupt withdrawal of circulating hormones(2, 6). The rapid induction of anesthesia with a mixture of thiopental sodium and a muscle relaxant may precipitate a dangerous vascular collapse(3).

CASE REPORT

Mrs. R. P., a 34-year-old white married woman, was referred for diagnosis and therapy after diagnostic studies in an out-of-state medical clinic had failed to reveal any pathological organic findings. Blood pressure was reported as normal. When first seen, January 16, 1956, she had the following complaints:

I have weak spells. I have had them for 5 years. I get so depressed and feel like I'd like to black out and escape. Feel "what is the use" and that

nothing is important. I must be falling apart. I get the weak spells right after getting up in the mornings—get tight in the throat, short of breath, and my heart beats fast. If I don't lie down I get the dry heaves. I have never fainted. My appetite is poor. I used to be afraid of dying. Outwardly I shake a little but inwardly tremble a lot. I have felt trembly on the inside twice today—get pale when I get trembly. I get mad and scream at my 2 children. I was never like that before I was married. I haven't been sleeping well lately as I am afraid of losing my mind or having a stroke.

During the first interview the patient suddenly locked the fingers of both hands over the top of her head and said:

Oh my head, my head. It feels like I was just struck on the top of my head with a club or by lightning. I can't stand it. I have only had 2 headaches like this before, both in the past year.

Tears streamed down her cheeks and her face bore the expression of both agony and terror. In about 3 minutes the headache seemed to stop and the patient completely regained her composure and resumed her former train of thought. Unfortunately her blood pressure was not taken during the headache but her pulse rate was found to be 100 per minute.

Her history revealed the fact that the patient was a perfectionist. Five years ago her mother died of cerebrovascular accident at the age of 56. Her husband is Catholic and the patient was Lutheran, a fact which caused some conflict on the patient's part.

The patient's complaints and sudden stunning and brief headache gave the examiner the disquieting impression of combined bizarre organicity and functional illness. Because of this, immediate hospitalization was advised. However, the patient stated that she had to return to her home at once for personal reasons but would accept hospitalization within a few days. No physical examination was done at the first interview. The diagnostic impression on that day was that the patient was probably suffering from an anxiety reaction with depressive features, associated with psycholepsy(11), because of the lightning-like suddenness of the headache. The organic possibilities were also kept in mind, with hypoglycemia and an intracranial lesion of some sort to be considered in the differential diagnosis.

The patient returned on the morning of January 26, 1956, and was admitted to the hospital at 1:10 p.m. the same day. A summary of the psychological tests (Rorschach, Thematic Apperception Test, and Sentence Completion Test) is as follows: certainly the anxiety noted in the case history is verified on the psychological test, as is the presence of certain obsessive-compulsive features.

On admission to the hospital TPR were 98.6° F., 72, and 20. Admission nurses' notes recorded that "Patient complains of headache. Asked for a cold cloth for her head. Appears to be nervous. Crying with headache." One of us made a complete physical and neurological examination at 4:00 p.m. on the day of admission. She was lying in bed holding the top of her head with both hands, complaining of a severe throbbing headache at the top of her head which had started about 1 hour prior to her admission. She weighed 115 pounds and was 62 inches tall. Her blood pressure was 112/80 in the left arm. Eye grounds appeared normal. Pupils were of average size and reacted normally. No abdominal masses were palpated. There was no visible tremor. The rest of the physical and neurological examinations was completely normal. Two hours later an intern also examined the patient and recorded that:

Pulse is 96. Blood pressure is 100/80. Patient lies with her eyes closed holding the top of her head and appears to be in some distress. Good heart tones. No murmurs. Frequent extrasystoles. Skin is warm and moist. My clinical impression is tension state but hypoglycemia, intracranial pathology and vascular anomaly should be ruled out.

The following orders were effective during the patient's entire period of hospitalization: (1) High caloric diet; (2) regular insulin, units V, 15 minutes before each meal; (3) octin hydrochloride gr. 1 intramuscularly every 3 hours p.r.n. for headache; (4) octin mucate, gr. 2 orally every 3 hours p.r.n. for headache—between intramuscular injections; (5) continuous tub in hydrotherapy, 30 minutes daily; (6) no barbiturates; (7) Thorazine, 25 mg. orally b.i.d.; (8) Serfin, 0.25 mg. orally b.i.d.; (9) Doriden, 0.25 gm. tablet at h.s. and repeat once if necessary.

On January 27, 1956, the patient stated

that her headache had disappeared after supper the previous evening and that she felt fine. Nurses' notes for this date included,

4:00 a.m.—TPR is 99.2° F, 112, 18. Sleeping most of the time. States she is hot. Pulse rapid. 8:00 a.m.—TPR was 99.2° F, 120, 20. No headache. Appears more calm. Cheerful. Complaining of gas and constipation. 4:00 p.m.—TPR was 98.4° F., 118, 20.

The following procedures were accomplished on the second or third day of her hospitalization: (1) Blood sugar—111 mg.; (2) urine—nagative; (3) red blood cells—4,780,00; (4) white blood cells—12,150; (5) Schilling differential: 4 eosinophiles, 85 segmenters, 11 lymphocytes; (6) X-ray of chest (P A)—no significant abnormality; (7) electrocardiogram: auricular rate 100, ventricular rate 100; P.R. interval—.14 sec., Q.S. interval—.07 sec., Q.T. interval—.32 sec., sinus rhythm, normal axis, EKG position—vertical, tall peaked P waves in leads, II and III. Diphasic T in leads II and III; Impression: auricular hypertrophy, myocardial changes: (8) electroencephalogram—no evidence of a cortical disturbance.

Nurses' notes on January 28, 1956 revealed the following:

8:00 a.m.—TPR is 99.2° F, 110, 20; 4:00 p.m.—TPR is 99.2° F, 105,20. In afternoon was cheerful and talkative. Is a little shaky. Got up to bathroom and became very weak and trembly. Assisted to bed. Had some headache but this seemed to pass. Feels very discouraged. Lunch taken poorly. Slept well most of the night.

On this day the patient spontaneously ventilated considerable hostility toward her husband for not taking an active interest in their household as well as for ignoring her during the early hours of an impending miscarriage. Associated guilt feelings were also verbalized.

Nurses' notes on January 29, 1956 stated:

8:00 a.m.—TPR is 99.0° F, 100, 20; 4:00 p.m.—TPR is 99.0° F, 90, 20. [On the morning of January 30, 1956] slept well most of last night. 8:00 a.m.—TPR is 99.2° F, 100, 20. Up in chair. Having cold sweats. States that she is almost hysterical.

The psychiatric impression at this time was tension depression.

On January 30, 1956, lunch was omitted, in preparation for the patient's first electroconvulsive treatment. At 1:00 p.m. a capsule of Tuinal (1½ gr.) was given to decrease her apprehension of the procedure. At. 1:30 p.m. atropine sulfate (1/100 gr.) was injected hypodermically to reduce oral and pulmonary secretions. The patient was brought to the treatment room at 2:00 p.m. and seemed in excellent spirits and without unusual apprehension. At 2:15 p.m. a qualified physician anesthetist gave the patient 6 cc. of 2.5% sodium pentothal intravenously in about 60 seconds, immediately followed by the intravenous injection of 2 cc. of Anectine (succinylcholine chloride) in about 45 seconds. The anesthetist then immediately caused the patient to breathe pure oxygen rhythmically by means of a unit consisting of a small tank of oxygen, well-fitting face mask, and a rubber bag to permit manual compression of oxygen into the lungs. Since the Anectine fibrillations had ceased at 2:19 p.m. and the patient's color was excellent from forced oxygenation she was given an electroconvulsive treatment by means of the standard Medcraft machine, utilizing 130 volts at 0.6 of a second. The usual slow glissando effect was produced, with clonic movements of the eyebrows and toes for about 30 seconds constituting the entire external manifestation of the softened convulsion. The pulse rate varied between 90 and 100 for the next 9 minutes while she received forced oxygenation. At 2:28 p.m. the patient's own spontaneous respirations had returned sufficiently for forced oxygen to be discontinued. She was retained on the treatment table for another 5 minutes as she had a slight cough, which is rather common for a few minutes prior to awakening when Anectine has been used. She was then transferred to a recovery room bed adjacent to the treatment room. Her color was excellent. Pulse was 100 per minute and of good quality. The patient awakened at 2:45 p.m. and was unusually restless and apprehensive. Her pupils were extremely widely dilated. Pulse was of good quality, 110 per minute. She said, "I feel horrible. What happened to me? My back hurts. I'm sick at my stomach." She coughed up a small amount of frothy mucus. Both the anesthetist and the psychiatrist remained with the patient until 3:00 p.m. in order to observe and reassure her. Her lungs were clear to auscultation. A registered nurse and a practical

FIG. 1.—Posterior view of viscera showing normal right adrenal and pheochromocytoma of left adrenal.

FIG. 2.—Close-up of left kidney and pheochromocytoma lying between left kidney and left lung.

FIG. 3.—Cut surface of pheochromocytoma, showing solitary cyst.

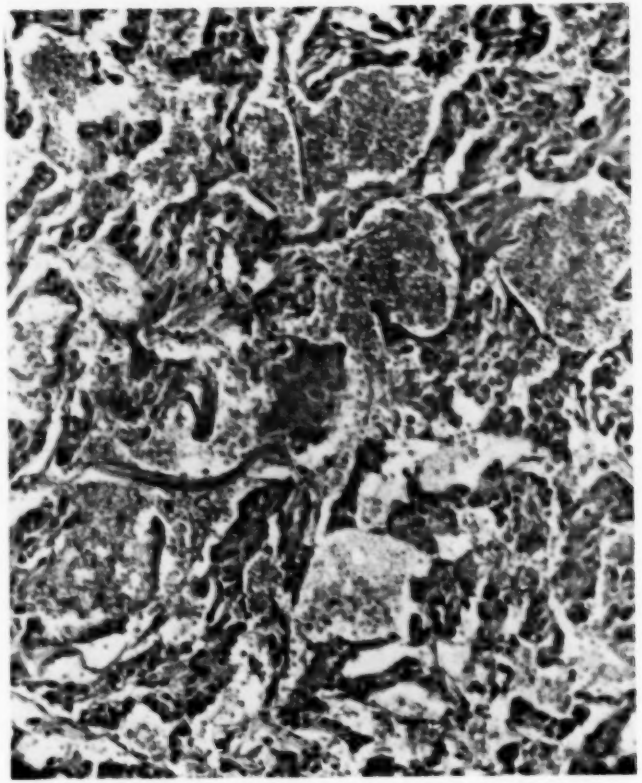

FIG. 4.—Low power photomicrograph (× 100) of pheochromocytoma, showing large vascular spaces and characteristic arrangement of granular cells.

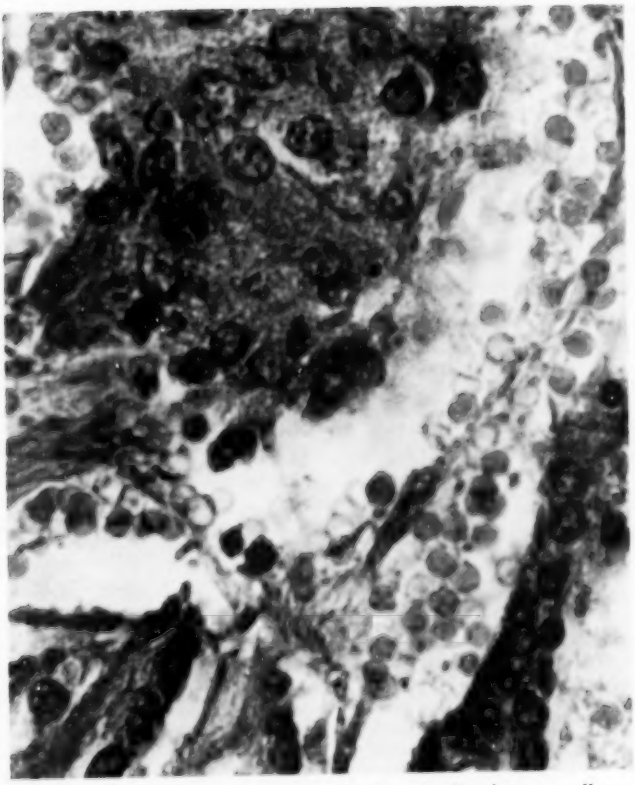

FIG. 5.—Photomicrograph (×400) showing details of tumor cells.

nurse were then left with the patient. Ten minutes later the 2 nurses noted that the patient had "cold and clammy" hands and feet and that her face had an ashen appearance. Two internes were summoned and arrived at 3:15 p.m., one minute after the apparent simultaneous cessation of both heart beat and respiration. Thirty seconds later one interne started artificial respiration with the apparatus used previously by the anesthetist. At 3:16 p.m. the psychiatrist injected 2 cc. of 1:1000 adrenaline directly into the patient's heart. A tracheotomy was then done in order to remove possibly aspirated material from the trachea. Suction with a catheter disclosed nothing unusual. Since the heart beat did not return following the intracardiac injection of adrenaline, one of the internes massaged the heart directly with 2 fingers, through an incision in the 4th left intercostal space. The heart beat returned at 3:19 p.m. and was counted at 140 beats per minute. The patient's pink color gradually returned as forced oxygenation was continued. One thousand cc. of 5% dextrose in saline were started intravenously, with 2 ampoules of Levophed and neosynephine in the infusion bottle. The anesthesiologist installed an endotracheal tube below the tracheotomy site, and the tracheotomy was sutured to assure an airtight fit. The patient was taken to the operating room with concurrent forced oxygenation and intravenous therapy. The chest surgeon's note stated:

Operation started at 4:40 p.m. Blood pressure was 60/0, lungs well expanded. The heart was beating rapidly and the muscle had good tone. Chest incision and tracheotomy incisions were closed. She suddenly died at 5:25 p.m. on January 30, 1956, at the end of the operation. It appeared quite certain that her cardiac and respiratory standstill were of central origin, since her pupils had been widely dilated since the beginning of cardiac arrest. It was not deemed wise to try further cardiac massage.

Abstract of Autopsy Findings

General Appearance.—The arterially embalmed body is that of a well nourished, well developed young woman weighing approximately 120 pounds. The body is opened by the usual "Y" incision. The red-tan musculature and yellow-tan subcutaneous tissue are moist. The peritoneal surfaces are moist and glistening.

Thoracic Cavity.—The right dome of the diaphragm lies at the level of the fourth rib, anteriorly, and the left dome lies at the level of the fourth interspace, anteriorly. The pleural surfaces are smooth and glistening.

Heart.—Weight 273 gms. The pericardium is not grossly remarkable and the pericardial sac contains approximately 20 cc. of fairly yellow fluid. The left ventricle is somewhat prominent. The epicardium is smooth and glistening and the red-tan myocardium is not grossly remarkable. The endocardium is smooth and glistening and the valve cusps are thin and flexible. The right ventricular myocardium measures up to 0.3 cms. in thickness and the left up to 1.5 cms. The valve circumferences in centimeters are: tricuspid, 11.5; pulmonary, 7; mitral, 7-5; aortic, 6.5. The coronary arteries are widely patent and show no gross arteriosclerosis.

Lungs.—The right lung weighs 815 gm.; the left, 720 gm. The trachea and major bronchi are filled with frothy pink material. The posterior two-thirds of both lungs is of a dark purple color and the cut surfaces are extremely moist and dark purple in color. The anterior one-third of the lungs are tan and crepitant but the cut surfaces are quite moist.

Major Blood Vessels.—The aorta and its major branches and the vena cava and its major branches reveal nothing remarkable.

Liver.—Weight 1360 gm. It has a brown and tan mottled cut surface.

Gall Bladder and Bile Ducts.—These structures are not grossly remarkable. The common bile duct is patent.

Spleen.—Weight 105 gm.; not grossly remarkable.

Pancreas.—Weight 105 gms.; not grossly remarkable.

Gastro-Intestinal Tract.—The stomach is bloated with gas and the remainder of the gastro-intestinal tract it not remarkable.

Adrenals.—The right adrenal weighs 10 gm. and is not grossly remarkable. In the place of the left adrenal just above the kidney is a 7 x 6 x 4 cm. smooth globular freely movable mass which weighs 128 gm. (See accompanying figures.) Cut surface of this mass has a soft tan and gray lobulated appearance.

Kidneys.—The right kidney weighs 125 gm.; the left, 135 gm. The capsules strip with ease and reveal a smooth pink-tan surface. Cut surfaces reveal normal architecture except in the left kidney there are 3 approximately 0.5 cm. cystic areas. Two of these are located in the cortex and one in the medullary area.

Pelvic Organs.—The urinary bladder is distended with urine but is not otherwise remarkable. The uterus, tubes, and ovaries are symmetrical and of normal size and contour.

Brain.—There is no evidence of meningeal hemorrhage and cut surfaces of the brain reveal nothing remarkable.

Thyroid.—Weight 36 gms.; symmetrical. The cut surfaces are moderately soft, tan in color.

MICROSCOPIC NOTES

Heart.—Sections of the right and left ventricle and of the left auricular appendage reveal a smooth endocardium, not microscopically remarkable. The left ventricular myocardium shows moderate increase in the size of the myocardial fibers with distortion and variability in shape of the nuclei.

Lungs.—Multiple sections show the alveoli distended with homogeneous pink-staining material—evidently albuminous precipitate from edema fluid. The blood vessels are distended and engorged with red blood cells. In some areas many extravasated red blood cells are seen in the alveoli. Many of the small bronchi also contain pink-staining material. Marked dilatation of alveoli is present in those portions of the lungs not containing pink-staining material. There is a sparse infiltration of granulocytes and superficial erosion of patches of tracheal mucosa.

Liver.—Sections show normal architecture with rather well defined sinusoids. The portal areas are infiltrated by lymphocytes and a few neutrophils.

Spleen.—Sections show a moderate degree of subendothelial hyalin thickening of the arterioles.

Pancreas.—Sections are not remarkable.

Gastro-Intestinal Tract.—Sections of the stomach show scattered lymphocytes, plasma cells, and large mononuclears in the mucosal stroma near the surface. Sections of duodenum show autolysis of the mucosa and are not otherwise remarkable. Sections of ileum show large aggregates of lymphocytes in the mucosa—some with germinal centers. A section of the appendix is not remarkable.

Adrenals.—Sections of the right adrenal are not remarkable.

Sections from the left adrenal tumor show a well-defined, thin fibrous capsule. Residual compressed cortical cell groups are found in the area immediately beneath the capsule. The tumor is made up of closely packed groups of large ragged cells with a granular basophilic cytoplasm. The nuclei are relatively uniform and round in contour, with a light reticular appearance, and a single nucleolus. The cytoplasm in the more central portions of the tumor has a granular and brownish cast in both the zenker's and formalin fixed tissue.

A portion of the tumor was submitted to the St. Luke's Hospital biochemical laboratory. Report by R. O. Bowman, Ph. D.: "Extracts freed of color and protein with tungstic acid, EtOH, and CCl_3COOH. These are very strongly positive for Phenolic substances. With Folin uric acid reagent color equivalent to 170 mg. per 100 gm. frozen wet wt. of tissue. Extract caused vasoconstriction in G. pig conjuctiva."

Kidneys.—There are occasional afferent glomerular arterioles showing subendothelial hyalin thickening and occasional glomeruli show slightly thickened hyalinized capsules. The epithelium of the convoluted tubules is swollen and granular. The cytoplasm is strongly eosinophilic. A rare collecting tubule contains a granular calcium salt deposit. Simple tubular cysts are present in the left kidney.

Urinary Bladder.—Sections are not remarkable.

Uterus, Cervix, Ovaries.—Sections of the uterus not remarkable. Sections of the cervix show cystic mucinous glands. The ovaries are not remarkable. One ovary contains a corpus luteum with hemorrhagic center showing early organization of the clot.

Thyroid.—Sections show groups of follicles separated by ill-defined fibrous septa. The follicles are filled with colloid and lined by cuboidal epithlium. A few lymph follicles with germinal centers are seen.

Pituitary.—Sections not remarkable.

Brain.—Sections from the cerebral cortex show slight to moderate dilatation of the Virchow-Robin spaces.

DIAGNOSIS

(1) Pheochromocytoma, left adrenal; (2) pulmonary edema, bilateral, severe; (3) nephrosclerosis, bilateral, mild; (4) arteriosclerosis, spleen, mild; (5) left ventricular hypertrophy, mild; (6) surgery, recent, (a) left thoracotomy, (b) tracheostomy.

Discussion

Hindsight in this case reveals the fact that the pheochromocytoma was "silent" mainly because of the absence of both paroxysmal and sustained hypertension. However, the following signs and symptoms in our patient have been previously described in the literature on pheochromocytoma: (1) Unusually severe headache which strikes the patient suddenly, as a "bolt from the blue"; (2) unexplained low-grade fever; (3) weak spells early in the morning; (4) the presence of "the dry heaves" this is the nausea and vomiting referred to by Marriott(7); (5) persistent tachycardia out of proportion to the degree of manifest anxiety; (6) electrocardiographic changes.

This patient's death was probably due to a combination of the following factors: (1) The electroconvulsive therapy itself; (2) the type and quantity of anesthetic used; (3) the extreme apprehensiveness which developed in the immediate postshock period. The danger of precipitating a severe vascular collapse with thiopental sodium and a muscle relaxant, in cases of pheochromocytoma, has been previously mentioned(3). Emotional upset alone is known to cause death by producing an "adrenosympathetic crisis."

Conclusions

1. A case of pheochromocytoma is reported with a fatal cardiac arrest following electroconvlusive therapy. The diagnosis was particularly difficult as no paroxysm of hypertension was ever detected. In addition, there was no sustained hypertension to arouse suspicion. Although a little atypical the patient's signs and symptoms suggested a tension depression.

2. It is certain that pheochromocytoma is an absolute contraindication to electroconvulsive therapy. The authors could find no previous report in the literature on this matter.

3. This case is presented primarily so that other psychiatrists may become more aware of a tumor which can produce symptoms distressingly similar to those found in various anxiety states with or without depression.

ACKNOWLEDGMENT

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CULTURAL ANTHROPOLOGY AND SOCIAL PSYCHIATRY

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Studies that reveal incidence rates or even the prevalence of various kinds of mental malfunctioning or healthy adaptation in a series of cultures actually estimate *how much* malfunction or adjustment exists or can pile up in each specific culture. As such, these studies are epidemiological. They are administratively useful in pointing to the scope of the problem and in outlining factually and statistically further questions and hypotheses concerning the *how* and *why* of malfunction and adjustment.

At this point, however, research in psychiatry ordinarily retreats from *general* epidemiological questions back to specific etiological (or psychodynamic and therapeutic) matters concerning a single patient, or a series of patients, ambulatory or confined. The statistics are left for their possible relevance to educative and training programs, or to clinical program development. Diagnostics and therapy receive no direct aid. But social psychiatry must pursue the problem further.

Social psychiatry, Rennie indicates, is not a new kind of psychiatry, but a new extension in research of emphases implicit in the work of many men: Freud, Adolf Meyer, H. S. Sullivan, Sapir, Linton, and Kluckhohn, to mention only a few. As Diethelm points out, both the knowledge and modern treatment of all types and intensities of personality disorder stem from such increasingly environmentalist sources as, first, Kraepelin's experimental procedures and clear descriptions of psychopathological phenomena, followed by Freud's psychodynamic and genetic approach, and Meyer's stress upon environmental relationship and physiologic manifestation. Diethelm, in defining the individual biological unit, therefore, includes subjective, objective, psychodynamic, and socio-cultural aspects, noting further that the socio-biological unit, in whatever state of integration, can bring to bear upon past, present, or even future events its relationships to reality or fancy, to personal or social functions (10, xiii, xv). Phenomenologically considered, there must then be intimate connections between the organization of a personality as it functions at any point in time, and its cultural background and current or past social contexts.

The above list of anthropologists and psychiatrists of similar persuasion is peculiar, despite its representation from 2 independent sciences, for its inclusion of those who stress the importance of context and interpersonal relationships in defining and motivating human behavior. Each man moved at times into the related field, was concerned with affective human behavior, and found active collaborators, or incurred intellectual debts, in contributing to interdisciplinary behavioral study.

Sapir long ago noted for anthropology that interest in man, as a *functioning* biological, social, and cultural unit, is best represented in modern psychiatry. Writing of a new multidisciplinary movement within psychiatry, Rennie describes under the heading of Social Psychiatry the trend which has taken place:

> . . . The phase of the psychiatrist's exclusive concern with the individual, his biography, and the internal dynamics of his functioning seems ready now to broaden into a concern for people in their community context and the social environment which plays such a large role in the formation of character and in the causation of mental disorders. . . . It appears, therefore, that psychiatry has moved historically through a period of almost exclusive concern for the patient in the hospital to the development of interest in the treatment of the ambulatory patient, and now to a study of the person in the community and society. This should give us increasingly concrete data for preventive psychiatry and public mental health programs (38, pp. 253-4).

In the same context, Rennie notes that some departments of psychiatry "have added anthropologists and sociologists to their staffs" (*op. cit.*, p. 253).

The necessity of studying human groups, differentiated as to age, sex, social status, and type or degree of cultural identification, requires immediately that organized teamwork be developed between anthropologists

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and psychiatrists so that comparable data are obtained for cultural groups, subcultures, and generation levels within a community. The matching of "normal" and "abnormal" cases within a statistical sampling procedure representative of a total community is desirable for further comparative studies aimed at controlling variables. Equally as important, the epidemiological baselines must provide the starting point for carefully guided etiological studies containing good diagnostic data and psychodynamic information tested thoroughly as to socio-cultural meanings and implications. Any less sensitive and rounded technique and research design will yield epidemiological information of sorts, but will not begin to touch the complex central core of psychiatry and behavioral science, their diagnostics, therapy, and even educative and preventive interests.

The reason for these strictures is not far to find and is implicit in the present day convergence of interests in the fields of psychiatry and anthropology. It is not that personality is, as Thomas stated at the beginning of this century, "the subjective aspect of a culture," a notion which Spiro(45) has recently and uncritically revived. Neither psychiatry nor anthropology can well afford to retreat to the notion of the single-individual representative of culture, nor to the exclusive concerns and reliances of the past to which Rennie calls attention. Rather, we may, without laying this extreme weight on a single individual, or singular case, describe each as an end product or sum total of the specifically weighted variables, social and cultural; past, present, and future (expectations, aspiration levels); real or imagined; personal and interpersonal—to which Diethelm calls attention.

While, indeed, the life of the emotions and their physiological concomitants have a hardy reality, nothing is further from the truth than the assumption that they exist without a history and context in a set of social and cultural forms or patterns every bit as real and more repetitiously reaffirmed than the resultant feelings. Similarly, allusions to social structure, social role, and social system are meaningless, as Parsons points out, without the establishment of a time-event action system as a whole in which human interaction or interpersonal system is overarched by traditional systems of values which give meaning to action. Perhaps a psychiatric metaphor would be more explicit. The anatomy and physiology of a social system relate ultimately to a further system of meanings, symbolic and traditional, historically and *culturally* derived, and personal in reference. This is to say that roles are culturally defined, that social structure varies with cultural background. The Czechs of a city may not be social climbers; the Hungarians may be. Entire social systems—in terms of which families operate and children are reared—may be built on foundations supplied by what Kluckhohn calls implicit (Sapir's "unconsciously patterned") and explicit (consciously followed) cultural beliefs.

Indeed, in cultural anthropology, whole systems or schools have been erected, and abandoned, on the premise that types of social structure may be studied alone and apart from the psychological qualifications of the meanings of cultural conduct and its impact on individuals. Such a system was Radcliffe-Brown's at Chicago in the 'thirties, or the equilibrium-disequilibrium theory at Harvard in the 'forties. In the meantime, Kardiner, Oberholzer, DuBois; Erikson and Kroeber; Redlich and Caudill; Hallowell and Klopfer; Benedict and Horney; Ruesch and Bateson; Joseph and Spicer; Mead and Wolfenstein; Leighton and Kluckhohn; Henry and Levy; Parsons and Lindemann, and others have either published together, conducted joint researches, or provided the kind of interstimulation noted above for Sapir and Sullivan. It may indeed be arduous to describe in any psychodynamic detail the stamping into physiologic manifestation and emotional economy of environmental experiences. Until this is done, however, there will be neither advancement in social psychiatry, nor a valid, cross-cultural science of culture and personality.

It was Sapir who provided, much earlier than the present penchant for national character studies of the unstructured sort, 2 statements, one directive and one somewhat in the nature of a methodological caution:

> . . . The unconscious nature of this patterning [*cultural*] consists not in any mysterious function of the racial or social mind reflected in the minds

of the individual members of society, but merely in a typical unawareness on the part of the individual of outlines and demarcations and significances of conduct which he is at all times implicitly following (42, p. 121).

And also from Sapir, in a much-neglected, late paper:

Certain recent attempts, in part brilliant and stimulating, to impose upon the actual psychologies of actual people, in continuous and tangible relations to each other, a generalized psychology *based on the real or supposed psychological implications of cultural forms* [italics mine] show clearly what confusions in our thinking are likely to result when social science turns psychiatric without, in the process, allowing its own historically determined concepts to dissolve into those . . . which have meaning for psychology and psychiatry. We then discover that whole cultures are paranoid or hysterical or obsessive! . . . The psychiatrist will have little to learn from them beyond the fact that human motivation has expressed itself in far more varied forms and through far more complex channels of transformation than he had believed possible on the basis of his limited ethnic experiences (43, p. 867).

For the anthropologist and psychiatrist, both must know that culture and personality are related variables; but as concerns the always unique and personalized systems of thought and affect in any individual, while it is always the individual who thinks, hopes, or acts, he is always one not merely with specific history, but with a particular place in social structure, and with a particular set of cultural beliefs and conditionings in his background. What was once crudely disposed of, even in the analytical literature, as "the primitive mind" equatable with *the* child, we now qualify further as to background and developmental influences. "Mind" is of course in one sense mental functioning, but it is also an organization of beliefs, attitudes, and mental patterns derived from social experience in a particular culture.

It is this more qualified sense which has, to date, yielded results in both psychiatry and anthropology, where thinking, reacting emotionally, and believing are referred to realistic experiential contexts, and affective states, emotional types, world outlooks, and even patterns of activity are found in the realm of institutionalized and uninstitutionalized cultural behavior. As anthropologists use the word "culture" it is no more reified, recondite, or maximized than this. In some references, it is similar to Benedict's use of the word *custom* (behavior at its most commonplace, typical, repeated, ordinary). Spelled out, culture in this last sense is a concrete and ever-active set of realities in the individual, as impressive, and actually much the same, as Freudian super-ego and ego-ideal—perhaps more impressive, since in place of a single theory of stages of mental organization and functioning, we now have responses to infant and child-handling modes, to family structure and functioning, to social and familial role and identification, to typical and meaningful life experiences, to a host of affectively charged (and recharged or reaffirmed) situations, to a pattern of values, ideologies, and meanings—in short, to realities imposed on a group by its manner of maintaining itself and its members.

Anthropologists need no introduction to the psychiatric nature of, or reasons for, latah, amok, spirit possession, conversion hysterias, Solomon Island or Japanese suicide rates, or the echolalia or echopraxia phenomena of the Ainus' *imu* seizures (49). They are also aware of endemic fads in illness arising under particular historical conditions of stress in a culture; of epidemiological as well as etiological interest are the Vailala "Madness" in New Guinea, Ghost Dance hysterias of various Indian tribes, anxiety neuroses among acculturated Saulteaux, extreme and compulsive forms of cultural revivalism becoming aberrant nativistic cults in a wide range of cases.

Similarly, in "contemporary cultures," the delayed recovery forms of chronic invalidism have been laid, statistically, at the door of social climbers, ulcer has been called an ailment of the middle class, and conduct disorders have been linked (possibly without point) here and in England to lower-class members and decliners, with note taken of Irish alcoholism. In Erich Fromm's study (14) a particular kind of authoritarian German family structure is related to traits of anxiety and rigidity, submissiveness, and neuroticism. The authoritarian personality studies of Adorno, Frenkel-Brunswik and colleagues are, of course, direct descendants of the German study. Hyde, in studies which are inconclusive but nevertheless interesting and timely in the 1940's, noted the pre-

ponderance within an Irish sample of selectees of chronic alcoholism and of what was then diagnosed as "psychopathic personality"; for a Jewish sample, he noted higher rates of psychoneurosis and low alcoholism; for an Italian sample, low rates of alcoholism, but high rates of conduct disorder and "acting out symptomatology"(24). Such samples (Hyde's were all males called for selective service in Boston) are inconclusive from the point of view of modern scientific needs, as were Brill's studies among the Eskimos before 1920, or Coriat's among the Yahgan. They are not really statistical nor truly epidemiological.

What is needed are studies which are at the same time cross-cultural and etiological in essence. Felix and Bowers put the matter succinctly:

> We need more intensive studies of personality structure and breakdown in a variety of cultural groups. Much of the current interest in cross-cultural personality structure is being pursued without adequate life history and clinical data. Such psychiatric studies of persons imbedded in different class and national cultures would not only provide a basis for validating present psychiatric theory, but would also provide insights into personality formation and structure that might otherwise escape us(13, pp. 139-40).

In the 8 years since this was written, an ambitious series of projects has been launched in which cultural anthropology figures prominently (*e.g.* the Stirling County Project in Nova Scotia, the Hutterite Mental Health Study, the Wellesley, Massachusetts, Human Relations Service, and the Metropolitan Project conducted by the department of psychiatry of Cornell University Medical College). Apart from these, the anthropologists' interest in personal documents, autobiographies, and clinically oriented case histories has grown. On the other hand, improper samples—highly selected or insufficient for careful exploration of a range of behavior—have been used in connection with biographies, Rorschach protocols, as have been *simpliste* psychogenetic assumptions about infantile disciplines(35, pp. 321-44).

There is no royal road to psychiatric understanding, or substitute for clinical data achieved through clinical methods. While Jules Henry's work on the close correspondence between Rorschach methodology and anthropological participant-observer techniques was reassuring, he has also indicated that no one clinical tool for assessing personality will suffice. In the epidemiological and certainly the etiological studies of a multidisciplinary sort, the functioning psychosocial units must be known to psychiatry and anthropology by a series of methods. Despite claims for the universal validity of such partially or incomplete diagnostic instruments as the Rorschach, their cross-cultural use is open to question at many points; for example where color pigments are a rarity and a curiosity or where the intricacies of Maori carving will lead, quite naturally, and especially in "abstracts," to minute attention paid to detail, or the tendency to look upon the white ("uncut, raised") portions of a card as those carrying the design.

Diethelm might again be cited on testing in psychiatry(10, pp. 9-10). Tests offer clues, not diagnostic certainties. As Klineberg has repeatedly pointed out, the limitation of nonpsychiatric psychological tests lies in more than one direction. In the first place, as tools, they apply a generalized or blunter measure to human materials which are always unique and idiosyncratic and difficult even for psychiatry to assess with its eclectically developed methodologies and distributive analysis. Secondly, the validity of that measure is always limited by the social and cultural contexts in which it originates and is validated. Thirdly, it may be assumed without too much difficulty that both Klineberg and Felix and Bowers are referring to further insights to be developed out of interdisciplinary technique that might otherwise escape us, not to methodologies and practices already extant.

Structuring these suggestions further, psychiatry is not only interested in culture-personality connections as a global thesis, it is primarily concerned with the question of cultural influence on (1) content and (2) dynamics of its known illness entities, for example the schizophrenias. Perhaps the phrase, "known illness entities," requires amendment. Meyer noted a range of illness types, not one illness or 4 subtypes merely to be covered by this nosology. Diethelm has repeatedly called attention to behavioral

changes, as in the schizophrenias, attendant upon such changes in hospital care and treatment which have occurred in the last 30 years. Syndrome types, like the "Hibernian syndrome" of Meyer have become rare among Irish of a different time and place. Apparently as cultures and contexts die, symptomatology dies. As new dynamics occur in the social and cultural scene, psychiatric nosology shifts not merely terminologically, but in response to the appearance and disappearance of generic disease entities.

What are some examples of content and dynamics which readily have cultural reference points as well as pan-psychic, or human, dynamisms? The question of content is simpler and a few scattered examples may suffice. In each of the following instances, the contribution of anthropology was required in the first instance to shed light on the situation as interpreted and utilized in the emotional economy of the patient.

First of all, our thesis is that content and dynamics are always interrelated and both have cultural connections of an etiological sort, not merely cultural coloring. A Chinese female patient (unmarried) after a woefully inadequate, tremulous, and mostly silent appearance in a clinic presentation, rises and smiles carefully, almost pointedly and separately to each of the doctors present. Was she blocked and confused in discussion; inappropriate in final affect? It appears that there are lifelong concerns about not fulfilling paternal expectations, about being female, about being acculturated, about drifting further beyond the reach of paternal approval. Even hospitalization incurs new debts and guilts. The smile-respect response required normally for Chinese younger females *vis à vis* older males, and, in this case, trained, respected scholars will inevitably affect doctor-patient relationships, transference, and countertransference phenomena. Yet assumptions of parental concern, rather than rejection, may be germinal in producing a kind of anxiety and withdrawal or poor socialization which is not part of the schizophrenic process. While there are schizophrenic processes in Chinese patients too, recognition of kinds of family settings and their operations, or kinds of valuational schemes and their meanings, allows one to enter into the spirit of both dynamic processes and the resulting, selected content, with an eye to accents and emphases important for any distributive analysis.

Take another example. In the author's first set of clinical experiences at the Morningside Psychiatric Clinic and Hospital in Portland, Oregon (federal reception hospital for Alaskan Indians and Eskimos, among others), despite the diagnostic labels of depressive illness, schizophrenia and the like, there were marked differences between frontier whites, Eskimos, and representatives of Alaskan and Canadian Northwest Coast Indian tribes, enough to warrant the study of each group as a series. An Eskimo's autistic fantasies might be laden, and often were, with the mythology and folklore of hunting from his particular group. The psychiatrists would call upon anthropology to determine the reference, personal or cultural, of the autisms. We would find that while food concerns, maternal rejection in acculturated communities, and autistic modes of attaining security functioned in the dynamics of a number of Eskimo male cases, the most extreme use of mythological-folkloristic real cultural materials was that of a childhood literally starved and neglected, a youth marked by accident and hunchback, a lifelong sexual frustration in a society which minimizes this possibility, and a maturity marked by a florid development of magical devices which guaranteed the good hunting of a good family provider. It did not matter that these devices were "real-cultural" rather than wholly autistic and personal. Seen in the light of a series of cases showing lesser, but similar, concerns the *kind* of use of real cultural materials reflected problems and conditions binding upon both the culture, and in more extreme forms, these patients. Since the author entertained doubts similar to Sapir's as to the advisability of describing the rank-stratified societies of the Northwest Coast as megalomaniac, or assuming that the normals of one culture are the abnormals of another (and vice versa), it was particularly useful to study real Kwakiutl or Tsimshian paranoid schizophrenics in which the paranoid development was evidenced not by flamboyant self-assurance or even a concretely validated conceit in bona fide relationships with others, but by

the most baseless and individually developed autistic fantasies, stemming from cultural breakdown, concerning affairs with white women, European princely titles, travels on the continent, etc.

At Tule Lake in California, the same kind of relationship to cultural stress systems was evident in case data where cultural materials and background conditions were ingredient in both content and dynamics. Environmental factors were involved not only in illness, but in prognosis. In one case, a meek and mild Japanese housewife, forced into continued Center residence and conformance with in-law Japanese standards of conduct by an unwise decision of her husband (who resembled her father and her older brother, and who must be respected) became depressed and then manic, killing 2 of 3 children in the latter stage and spreading their brain tissue ("their unspoken thoughts") on the 4 walls of the family's room; after escaping the constricting conditions of Center life by immediate hospitalization outside, stability was soon regained and marital life quietly resumed outside Center confines. There has been no recurrence of depression or anger outbursts since this time. Obviously, the definition of a case requires both psychiatric investigation and prior knowledge of specific personal *and* cultural conditions. Even further, a case often cannot be adequately understood without understanding kinds of cultural backgrounds (as of 2 parents), kinds of family functioning, parental-child roles, sex roles, duties, obligations, safety-valves, restrictions, values, and permissive aspects of the cultural setting in which it occurs.

Defining these cultures, especially the modern urban or urbanizing ones in which acculturation and illness phenomena, as Ruesch noted, are linked, is the first task of cultural anthropology in relation to social psychiatry. Other tasks would include a use, as consultant, not in therapeutic sessions with the patient, but in consultation with the psychiatrist on on-going cases; in the latter connection, even the so-called "American core culture" cases, as well as the Italian, Hungarian, Japanese, German, Indian, etc., should be scrutinized from this point of view, since exoticism or esoteric purpose is not the aim. Because the quick re-establishment of patients at work and in community life *is* the purpose, modes of therapy, questions concerning transference and countertransference, and the cultural stake of the therapist must be considered while again not entering into (or interfering with) therapeutic situations. In thinking back to the Japanese case mentioned above, one is reminded of the brilliant paper by Jacobson and Berenberg on Japanese psychiatry, particularly Morita-therapy, in which the connections with Zen Buddhism, Japanese social structure, and even distinctive systems of symptom formation and dissolution can not go unnoticed(25, 321-9). Calling attention, in general, to cultural determinants of behavior disorders, Edward Stainbrook(46) writes:

> . . . In the last decades of the nineteenth century, psychiatry was also ready, then as now, to develop a social and cultural area of research, both for theoretical and practical purposes. Then, the nosologic and etiologic tasks of psychiatry seemed to be solved or well on the way to solution, and psychiatrists sought to extend the limits of the behavioral horizon.

After marshalling data from the literature (since 1870), Stainbrook concludes:

> . . . A survey of the contemporary literature on culture and psychopathology demonstrates that the essential tasks both of delineating the prevalence and of describing the psychopathology and psychodynamics of behavioral disease in various societies are only in the preliminary phases of scientific execution. Cross-cultural comparisons of the frequency of schizophrenic disorders, for example, can be accomplished only by painstaking community studies in which psychiatrists and cultural anthropologists work in long-term collaboration. We do not yet have the results of such community research even in our own society(*op. cit.*, pp. 330-5).

Studies like Stainbrook's, just cited, on the psychopathology of schizophrenic behavior in the Bahian society of Brazil furnish an example of what is needed.

Already the literature, from 1870 on, is increasingly full of such references; the increase in melancholia in the asylums of England and Wales following the depression of 1875; the greater prevalence of disorders in Japan among the married than the unmarried; fewer deep depressions and suicides in British Guiana, on the average, than in England; the absence of "the French hysteria" in England; contrarily, that some of the female patients at the Chicago County Hospi-

tal resembled the French cases; the differences in composition and behavior of inmate populations in different parts of Germany; the differences in epidemiological incidence rates in Norwegian, British, and Irish studies; and so on, down to such recent studies as Halliday's on British trends in "Epidemiology and the Psychosomatic Affections" (20, pp. 185-191), Hyde's on American subcultures, Mahoney's on Okinawans, DuBois' on Alorese, Stainbrook's on Bahians, and others.

All these studies, whether psychiatric or anthropological, are in direct descent from the work of Kraepelin, who, following his Estonian professorship in psychiatry at the University of Dorpat, about 15 years later, made his psychiatric tour of different countries concluding that the clinical clusters of his diagnostic entities, while widespread, existed in somewhat different arrangement and frequency in different cultures. Mania and melancholia were rare in Java, and notions of having sinned were never expressed as part of a depressive reaction. Alcoholism was rare in certain cultures and absent in Java, but his dementia praecox category was of frequent occurrence there. Mayer-Gross reiterated these characteristics in Bumke's *Handbuch der Geisteskrankheiten* and they have been reaffirmed by Laubscher's studies of schizophrenic reactions in Bantu tribes. No doubt the generalized disease entities, processes and types exist widely, but differences in frequency, subtypes, typical psychodynamic processes, and disease manifestations are already common in the literature from varying cultures. No doubt, as Freud suggested, cultural dream and personal delusion are connected. Already psychiatry is aware that it is not dealing merely with Tweedledum or Tweedledee, either from the nosologic or from the cultural standpoint.

What is less obvious and more helpful for purposes of mutual development in social psychiatry and cultural anthropology is that the reference points of a culture, its value system, economy, language, expressive symbolism, communications, and even motor habits play some role even in idiosyncratic manifestations of individuals. In human nature and conduct, there are, as George H. Mead noted, no selves apart from others as even the infantile features and role-playing of psychotics (which do indeed come close to the border of things human) eloquently testify. Much of the mystery of culture-personality connections would dissolve if we overcame the popular notion that normal and abnormal represent two utterly different kinds of human psychological dynamics, the first being cultural and the second, a-cultural. We owe to an error of Ruth Benedict the related idea that the abnormals of one culture *could be* the normals of another. Her far more fruitful contribution was the point that cultures contain systems of enculturation and socialization, systems of operation, and systems of stress. As Parsons puts it, the constant enactment of roles within cultural systems which are transmitted, learned, and shared accounts for the fact that culture is on the one hand "the product of" and, on the other, "a determinant of" systems of human social interaction, whether stressful or not in one direction or another (36). Wilthout subscribing to the cultural mould theory, without reducing real individuals to abstract models, and without assuming, except for extremes, that normal and abnormal are unrelated processes (37, pp. 551-76), the individual is still "the product of" interaction systems in which cultural meanings and symbols are a prime determinant.

Social psychiatry, if it is to be social and remain psychiatry, must study individuals in relation to these systems, especially those seemingly unique and personalized systems known to be aberrant. Aberrant individuals and their problems, even more than the "normals" of a culture, dramatize and epitomize in thought and affect the cultural stress system and its impact upon individuals. It is one thing to note for Puerto Rican migrants in general their problems of infancy oral frustration, their sex segregation, dual standards, emphases on male sex potency, the unconscious hostilities of the "second sex," and the total background of rapid urbanization, economic poverty and dislocation, involvement of women in the labor force and their gradual emancipation from the family. It is another thing to measure the distillate of psychosomatic stomach and digestive disorders, male fears of impotence, prostitution, homosexuality, brittle marriages and incest fears, deprivation of maternal care, and inter-

sex hostility in the actual lives of actual people. To date, literature has been most sensitive to this task as where Macken's Irish *Bogman,* Zilahy's upperclass Hungarian *Dukays,* or Thomas Mann's *Buddenbrooks* dramatize the possibilities of expression or repression within cultural forms. Verga's *House By the Medlar Tree* or Mangione's *Monte Allegro* dramatize for Sicily and Little Sicily. Such perspectives are too valuable for behavioral science to forfeit to fiction or to fail to quantify or study scientifically.

The relatively short list of disease entities, each covering a *range* of process and symptoms, may be related in the long run to panhuman psychic processes, ego defense mechanisms, elementary human needs, or general human psychology(31, pp. 346-53; 34, pp. 91-127). To say so, however, is speculative and simplifying on *a priori* grounds. Schizophrenias, for example, seem to occur with at least some characteristic features in common from a given culture (Opler: Morningside data; 6,). Arctic "hysteria" (no doubt a misnomer) or the Ainu's *imu*(50) illness are not only bounded by culture area and culture, but have for example in *imu* a characteristic sex and age pattern. The Trobriand Vada witchcraft or the Bathonga Beloi Cult are understandable only in their specific contexts. Controlled acculturation studies of disease entities are possible in view of the cases like Malaysian amok and the recurrence of the pattern, though rarely, among second-generation Filipino immigrants in Hell's Half Acre of Honolulu.

In addition to the limited number of entities and their more than characteristic coloring in given cultures, psychiatry has already established that there is no single model of psychodynamics within a culture. Neither are there endless forms or patterns within a culture or cross-culturally. No doubt we are dealing here with a refinement of what Goldenweiser termed the principle of limited possibilities in culture. The limited number of disease entities seems to be reflective of gross similarities, physiological and psychic, within the species. The crystallization of illness subtypes within given cultures, as noted in the literature, argues for similarities, not identities, in psychodynamics and available content within a cultural frame; differentiation by age, sex, marital status, social status, and type of family (especially, of orientation) may bring greater precision into such data.

At any rate, attempts to correlate cultural conditions and psychodynamic processes with the generalized nosologic labels now available are doomed to failure since an entity like schizophrenia, already known to vary in detail with culture, itself covers a range of phenomena as Meyer noted, and is even responsive in its symptom aspects to types of treatment as Diethelm has pointed out. Whether Beloi Cult suspicions and Vada Cult sorceries exist is also important since a culture may have at hand, as did Chukchi with its patriarchal authority, high *kalyms* or bride prices, frustrations for camp herders and laborers, etc., such outlets as male transvestism, hallucinatory shamanism, and turbulent postadolescence phenomena. In our metropolitan study, the need for cultural-etiological studies of series of cases from a variety of contrasting cultural settings is well recognized. Degree of cultural identification, or resistance to role identification with a parent of same sex is not seen merely as a stage in Oedipal striving *sub specie aeternitatis,* but as having a characteristic imprint in one setting which may vary in another, as being sufficient to modify a deeply ingrained system of affect, as being enough to perpetuate and fixate a rooted system of cathexes, or shape a basic personality, or erect a rigid and inflexible system of ego-defenses. No two cultures will be the same so as to produce identity in normal behavior. It is assumptive to suppose that reaction formations will be the same in either.

There have been studies, hitherto, of various kinds of illness pathology which are associated primarily with research in physical anthropology(1, pp. 120-6). In these views, the illness pathology of a society is said to reflect its general conditions, offering data and insights to the understanding of the culture at the same time. As is well known, Hooton and J. Lawrence Angel have studied physique and illness in a variety of social settings. When it is remembered that rheumatoid arthritis, essential hypertension, duodenal ulcer, various skin disturbances, asthma, and diabetes—to mention only a few ailments with psychogenic components—have emo-

tional moorings, the suggestion is again clear that a culture should be studied in both its medical and psychological dimensions at the same time. The requirement of modern medicine, as applied and practical knowledge, is that anthropology add to the whole field of (social and anthropological) medicine. Galen's ancient phrase, "Man is a unit with his environment," requires steady exemplification in cultural-medical-psychiatric studies (7, pp. 771-806).

Our New York contemporary cultures project, in an urban setting, and its predecessor, the Stirling rural and town study, have from the start recognized that the crucial information will lie not in prevalence and incidence data, though these facts provide the baseline for thinking relating to action programs and program planning. What psychiatry requires even more urgently are contributions to its fund of diagnostic, nosological, and therapeutic techniques. As in all sciences, the Linnaean problems of typological classification must be merged with a Darwinian awareness of processual uniformities or principles where these, indeed, do exist. At this stage, as we have suggested, a specific knowledge of the relationships of syndrome formations and their settings and typical psychodynamics is more needed than mere elaboration of the nosologic or psychosomatic dictionary as it now stands. What Meyer stressed as an assessment of general and environmentally induced experience or Freud termed a genetic approach can today be seen as a psychiatric study of personality in culture. The challenge of Meyer to an oversimplified and rigid nosology and his interest in the patient's adaptation to such environmental milieus as hospitals and systems of privilege were steps in this direction. Today, as in the Stanton and Schwartz(47), Rowland(40) and Devereux(8) studies, the "culture" of hospital settings has been studied in relation to therapeutic problems. In exactly this way, in patient-centered therapeutic studies, a knowledge of positive relationships, satisfactions, and values which a patient's culture affords would be useful to the psychiatrist in considering the patient's problem. "Total push" therapy has yet to use cultural keys effectively; just as receptiveness of the family, and in English social psychiatry, the acceptance of the remitted patient's recovery are important factors(26, 48). Systems of symbolization and association have cultural reference. So do concepts of health and illness. If Erikson's theory of bodily zone emphases were correct in his volume, *Childhood and Society*, not only modern psychiatry, but the modern psychosomatic clinic would be afforded new approaches.

The net gain of such study and consultation to private and public psychiatry can be enormous. Preventive psychiatry, community clinics, rehabilitation programs, and even the early explorations of the psychiatrist on neutral grounds of cultural affiliation and interest stand to gain. On the other hand, as Sapir well knew, not merely society but behavioral science requires the psychiatrist. Better than most, he already realizes that a social existence is a necessary precondition for the development and growth of an individual human, and that milieu, context, and social relationship are the more-than-bread-alone by which we live.

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PHRENOPHAGIA: A FORM OF HUMAN ARTIFICIAL SELECTION

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Artificial selection has long been practiced in animal husbandry producing a great variety of useful domestic breeds. It has only occasionally been applied to mankind. One classical example is ancient Sparta where children showing little promise of becoming good warriors were often destroyed. It is interesting to note that once Sparta attained her ideal of a perfect military state, her creative capacity in philosophy, literature, and the plastic arts ceased. This happened at the time (500-400 B.C.) when nearby Hellenic cities, notably Athens, attained the heights of their creative development(1). In modern times, the Prussian King Frederick William I (1713-40) sought to breed his regiment of giant grenadiers with giant mates but died before he could realize the plan(2). His son, Frederick the Great, abandoned the idea as being without practical military value. More recently, the Nazi German authorities actively encouraged the propagation of the blond type in Europe. Their parallel plan to exterminate certain non-Germanic national groups is, strictly speaking, an experiment in genocide and not one of artificial selection. In the latter, individuals with certain desirable qualities are encouraged to procreate, others are marked for extinction. Evidence is presented in this article indicating that true human artificial selection on a large scale in time and space has been preeminently a Russian experiment first applied to her own people (the Muscovites) and later extended to neighboring national groups. The Russians have never been interested in exterminating any people. Their interest in this connection has been to liquidate only individuals, of any nationality including their own, inimical to their geopolitical ends.

It is the opinion of many geneticists that intelligence and many special abilities are basically innate, education serving mainly to render them manifest and to direct them into socially acceptable channels(3, 4). Any social process, therefore, which directly or indirectly interferes with the operation of heredity upon mental qualities is of vital concern to society as a whole and more particularly to workers in psychology, psychiatry, and the social sciences. The purpose of this article is to review briefly the phenomenon of artificial selection as it has existed in Russia and the peoples under her domination. Although the process is an old one, it has been little noted by social students in the West. Perhaps its tremendous scope in space and time, its very gradual and imperceptible development, and its relative isolation and concealment account for the fact that it has been able to reach its present state with little significant concern in other parts of the world.

The Russian state, officially known as the U.S.S.R., began as a tiny nucleus of the Duchy of Muscovy founded in 1156. It differed little from more than a score of similar duchies comprising the population of Russia at that time. In 1236, there swept across the Russ lands a Mongol invasion under the leadership of Batu Khan, a grandson of Jenghiz Khan. All Russia east of the Dnieper became vassal to the Mongol rulers. After pacification, the khans permitted the Russian dukes a degree of local autonomy but required strict obedience and regular payment of tribute. When a vassal duke appeared before his Mongol master he was obliged to prostrate himself on his face. To emphasize the relationship of master to slave, the khan would place his foot on the vassal's neck. Whether the vassal returned home from his mission depended upon how faithfully he had carried out the khan's bidding. In short, slavish obedience was the condition of survival during the Mongol captivity. This captivity lasted nearly 250 years or approximately 10 generations. During this period, the Russians missed completely the glory and the humanizing influence of the age of chivalry.

The dukes of Muscovy learned better than their neighboring cousins that servility to the khans could be made profitable. Ivan I (1328-

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40), known as Kaleta or Moneybags, became the official tax collector for the khan. His son Simeon (1340-53) was recognized by the khan as the chief among the Russian dukes. When the Mongol rule was finally overthrown by Ivan III (1480), the latter emerged as a fully fledged tsar with absolute powers. It was in his reign that a legend was born in Russia that Moscow was destined to be the third and final capital of the world superseding Rome and Constantinople(5).

The Mongol captivity served as an effective school in Eastern behavior patterns which included contempt for human dignity and values and proneness to solve social and political problems by uprooting of populations or mass homicide. Those who had resisted the Mongol conquerors perished. Those who survived did so because of a combination of ruthlessness at home and servility before their masters. It can only be conjectured to what degree there took place mixture between the Mongol and the Russian stocks. If other prolonged foreign occupations are any criteria, the mingling was probably considerable. Mongol captivity represents the first stage toward the extinction of the spirit of independence and ideological nonconformity in Russia.

The second stage was vigorously advanced by Ivan IV (1530-84), who, because of his extreme cruelty, is known to posterity as "the Terrible." Having lost both parents in childhood Ivan IV passed his early years under the regency of Moscow boyars, the chief among whom was one Andrew Shuisky. Ivan IV, a precocious child, observing the court intrigues taking place before his eyes, conceived an intense dislike toward Shuisky and the boyars generally. At the age of 13, he initiated his active rule by ordering Shuisky to be thrown to the dogs.

Ivan IV was a diligent student of Christian theology and an incisive dialectician. He held the conviction that only two ultimate values existed in the universe—God in heaven and he, the Tsar, God's right hand on earth. He consistently acted in accordance with this axiom. To insure the fulfillment of his will, he organized a powerful armed force of devoted followers whom he called the Oprichina. The Oprichina was the forerunner of the Okhrana and the Third Section of the later tsars and of the N.K.V.D. of Communist Russia. With the aid of the Oprichina Ivan IV virtually exterminated the population of several towns including Novgorod, an ancient and prosperous city with a proud tradition of autonomous rule. In Moscow, Ivan IV purged methodically for "treason" the more prominent boyars. As he condemned the head of a given family to a torturous death, he insisted on the liquidation of all his descendants including infants in order to "pluck out treason with the roots." The exact total of his victims is, of course, unknown. Estimates of the Novgorod massacre range from 30,000 to 60,000.. Near the end of his life, Ivan IV sadly catalogued the more important "executions" of his reign and ordered prayers said for their souls. The list thus compiled reached more than 3,000 entries(6).

An event occurred in the reign of Ivan IV fraught with potentialities for the future of Russia and her inexorable experiment in human selection. In 1581 Siberia was discovered and conquered by a Muscovite named Yermak who offered it as a gift to the Tsar. This vast, frigid, and nearly empty land was ideally suited to serve as a cold storage for rebellious, recalcitrant, and otherwise undesirable persons. Anyone whose motives were suspect could be removed into this desolate land thousands of miles from home and kept there as long as desired. Because of the immense distances without human habitation and the extremely cold winters, escape from such an exile was virtually impossible.

Every generation of Russians in more than 3 centuries witnessed long columns of political exiles—nonconformists, revolutionaries, writers, students, patriots of conquered provinces, people of intelligence and refinement—eastward bound toward Siberia. The journey on foot required many months. Some never reached their destination. Others died in exile. Few returned in fit condition for active life or procreation.

Extermination of nonconformist elements was conducted with new vigor by Peter I (1672-1725), who regarded himself as the logical successor of Ivan IV and whom Lenin in turn considered to be his ideological predecessor. Peter I liquidated the ancient military organization, the Streltsy (1698), by

the simple expedient of several thousand decapitations. It is said that with his own hand the Tsar cut off the first 5—or the first 20 heads, as an encouragement to his officers to assist in the executions. The bodies of the victims were suspended from the walls of the Kremlin for 5 months—a mute exhibit for the people of Moscow to behold and to ponder(7).

Less drastic but equally effective was Peter's liquidation of the autonomy of the Ukrainian Cossacks, long renowned for their spirit of freedom. The pretext was the defection of some of them during the Swedish wars. First, the Ukrainian officers were replaced by Muscovites. Then Peter I ordered their regiments to be scattered in various parts of the Empire to serve as slave laborers in the construction of his many projects: 24,000 were sent to dig the Ladoga canal; 38,000 were exiled to Persia; and 60,000 were sent to work on fortifications on the Sea of Azov. Many of these exiles perished from disease, starvation, or adverse climate. Few ever saw their native land again.

In the nineteenth century after the Polish partitions, the process of weeding out nonconformist elements was extended to Poland and the Baltic provinces as well as the Ukraine. One example will illustrate the thoroughness of this selective process as it was applied to Lithuania in the reign of Nicholas I (1796-1855). The order of expatriation was issued by Bloudov, minister of the interior, in connection with a previous order for the banishment of 5,000 families of Polish nobility to the Caucasus (April 6, 1832):

> In the month of October, last year [1831], a supreme order appeared concerning the transportation from Podolia to the Caucasus of 5,000 families of Polish gentlemen, formerly so-called, henceforth to bear the name of freedmen and citizens. The committee entrusted with the affairs of the provinces reconquered from Poland, to be reunited to Russia, has ordered, by a rescript confirmed by His Majesty, that all persons be transported who desire it and moreover, (1) those who having taken part in the last insurrection returned at the appointed time to testify their repentance, as well as those who obtained the grace and pardon of His Majesty. (2) Those persons whose mode of life, in the opinion of the local authorities, is not such as to entitle them to confidence of the Government, but may be regarded as suspicious. The rules presented for carrying out this order have received His Majesty's sanction. His Majesty, in confirming them, deigned to add with his own hand: "These rules to serve not only for the province of Podolia but also for all other western provinces, Vilno, Grodno, Vitebsk, Mohilev, Bialystok, Minsk, Volynia and Kiev which will make altogether 45,000 families."
>
> His Majesty has moreover ordered, (1) the persons to be transported are not to be warned beforehand. In no case shall the Government be responsible for the debts of the persons transported. Their creditors will act according to the law, but this must not prevent the transportation taking place. (2) Men capable of working are to be transported first; their families to be sent afterwards. (3) Gentlemen, formerly so-called, who are not landed proprietors, who have no fixed incomes or occupations, who leave their place of residence, or who remain without employment, are to be transported to the line of the Caucasus, among the Cossacks and to be enrolled among them; and, as in the future they will form a part of the Cossack troops, their colony must have no communication with the colonies of the other Polish gentlemen, formerly so-called[8].

Prince Peter Alexeivich Kropotkin (1842-1921), a geographer of note and a keen observer, had travelled extensively in central and eastern Siberia on government missions. He left the following remarks about a group of Polish exiles whom he encountered there:

> 11,000 Poles, men, women and children were in eastern Siberia—students, artists, ex-officers and nobles and skilled artisans from the highly developed workers of Warsaw and other towns. They were employed at hard labor in forests, iron works and salt mines. I saw some of the latter on the Lena standing half-naked in a shanty, around an immense cauldron filled with salt brine and mixing the thick boiling brine with long shovels in an infernal temperature while the gates of the shanty were wide open to make a strong current of glacial air. After two years of such work, these martyrs were sure to die of consumption[9].

Besides the victims exiled to distant regions of the Empire, others were kept in prison in their home areas often languishing for months or years before a "trial."

Another convenient outlet for undesirables was the army, where prior to 1873 the military service of 25 years was practically synonymous with life. All of these measures, wherever applied, were calculated to weaken the spiritual forces of freedom and to reenforce those of submissiveness. It is not surprising that it was the Russian physiologist Pavlov who added to the classification of reflexes 2 novel ones, the reflex of freedom and

the reflex of slavery. He describes the reflex of slavery as follows:

> With the reflex of freedom there exists also an inborn reflex of slavish submission. It is a well known fact that puppies and small dogs often fall on their backs in the presence of larger ones. This is the surrendering of self to the wishes of the strong, the analogy of the man's falling on his knees or prone on his face—the reflex of slavery. . . . How often and varied appears the reflex of slavery on Russian soil and how useful to recognize it[10].

Other prominent Russians voiced similar convictions. Nicholas I in a discussion with a French visitor (Custine) said: "Despotism is the essence of my government but it is in harmony with the genius of the nation"(11). Tsar's ministers proudly declared themselves to be his slaves. The poet Lermontov(11) expressed the same sentiment in verse: "Let me be a slave but the slave of the master of the world."

In the course of history Russia had several opportunities to liberalize her government but somehow managed to fumble them. Thus it was in the Times of Trouble (1605-13) when the boyars rejected the Polish concepts of a constitutional monarchy. In the years of the "petticoat rule" (1725-96), the palace revolutions failed to make a perceptible dent in the pillar of autocracy. Alexander I, who loved to pose in the capitals of Europe as the champion of liberalism, not only failed to liberalize Russia but rendered impotent the constitution he deigned to grant to Congressional Poland. In Russia, his council of ministers and the senate "endowed with certain theoretical powers, became in the end but the slavish instrument of the Tsar and his favorites of the moment"(12). Nicholas I, Alexander's brother, cast aside the cloak of hypocrisy and acted the part of the autocrat without reservations or excuses. So did Alexander III. Alexander II, the liberator of the serfs, never permitted his subjects a voice in anything beyond the local land assemblies. After the foundations of tsarism were shaken by the revolution of 1905, Nicholas II did create a Duma in imitation of the parliaments of Europe, but soon this body also became transformed into a humble instrument of the Tsar's favorites. The Revolution of 1917 brought about "a strange interlude" of democratic government, which, however, was quickly stifled by the Bolshevik counter-revolution. White tsarism was succeeded by the Red tsarism. The polished aristocratic despots of tsarist Russia gave way to the more ruthless autocrats from "the masses." In 1936, the Soviet government framed an elaborate constitution, "the most advanced in the world." After this "epochal" achievement was duly propagandized in the capitalist world, the document was placed in storage, and Russia continued on her road of tyranny more all-pervading than that of the tsars.

Not only did the Russians reject consistently opportunities to democratize their institutions but they treated with contempt their weak or liberal rulers and often killed them (Peter III, Paul I, Alexander II, Nicholas II). On the other hand they allowed their strong and ruthless despots to die, so far as is known, a natural death (Ivan IV, Peter I, Catherine II, Nicholas I, Lenin, Stalin).

While the process of liquidation of those endowed with the "reflex" of freedom during the days of the tsars was at times hesitant, after the Bolshevik revolution it advanced with the crushing power of a steam roller. The monstrous plan conceived by the Bolshevik hierarchy was to liquidate the following: (1) aristocracy and landed gentry, (2) merchant class, (3) industrialists, (4) clergy, (5) non-Communist intelligentsia. One might add to these groups all communists deviating from the hierarchy's concepts of orthodoxy. In short, the entire apex of the Russian social pyramid was to be destroyed.

Those of the first 3 groups who had not been killed during the revolution fled in droves to Western Europe, China, and other places. Many of them can be seen today in the capitals of Europe earning their living as waiters, taxi drivers, tourist guides, business men, etc.

The progress achieved in the liquidation of the religious life between 1917 and 1941 was as follows: the number of churches was reduced from 46,457 to 4,225; monasteries from 1,026 to 37; priests from approximately 50,000 to 5,665; deacons from 15,210 to 3,100. When the Russians conquered the Ukrainian provinces of Poland, they made short shrift of the Greek-Catholic Church,

embracing nearly 4 million members. Four bishops and a quarter of the clergy were arrested and exiled. The rest who submitted were allowed to send a message to Stalin expressing their desire to return to the bosom of the "Holy Russian Orthodox Church of our forefathers"(13).

The Russian clergy accepted the shackles of their Communist masters with the same genius for adaptability with which in the past they had submitted to the tsars. In 1930, Metropolitan Sergei, representing the church of Moscow, declared to the press that "there never were persecutions of religion in Russia" and that stories of repressions and cruelties were "pure inventions and slander" (13).

The undesirable persons of other classes, notably kulaks or "rich" farmers were either starved systematically by confiscation of their food supplies or deported to Siberia by countless thousands. The liquidation of the kulaks "as a class" reached its peak in 1932-33 when millions died in a famine induced by the authorities(14).

As a result of mass banishments to Siberia during the Communist regime there has risen in Asiatic Russia a huge slave class, constantly renewed and moderately estimated at more than 5 million souls(13). In 1940 from eastern Poland alone more than one million people were scattered in different parts of the U.S.S.R. from arctic Russia to the Pacific coast. In order to hasten the dissolution of national and family ties, fathers were separated from women and children, in most instances never to be reunited.

Once I discussed this subject with an intelligent Russian worker who had lived in America since World War I. His replies to my questions were interesting from the point of view of the mental conditioning of a Russian even after long exposure to the American way of life. To the question, why did the Russian authorities uproot so many people from their ancestral homes, his reply was that Siberia is a rich country with infinite opportunities. To the question, why did they see fit to break up family groups, his unabashed answer was that the factories in some regions require male, in others female help.

The method of transportation was particularly inhuman. The deported were herded tightly in freight cars equipped with a small stove and a hole cut in the floor. Within such confines the victims remained for from 2 to 4 weeks without permission to get out on station platforms to exercise their limbs. Thousands of persons especially infants and small children died before reaching their destination from lack of food and exposure (15).

Perhaps the most dramatic proof of purposeful extermination of the upper social strata wherever found, was the massacre of several thousand Polish officer war prisoners in the Katyn woods near Smolensk. The men were killed in a typically Eastern style with their hands tied behind them and a bullet through the back of the head. At the time of the discovery of the bodies, there was a great deal of debating in the West as to the authorship of this deed. Stalin himself answered those who had any doubt when at Yalta (1945) he drank a toast to the death of 50,000 German officers.

Since 1945, Russia has extended her experiment in human artificial selection to several countries of central Europe, each with ancient traditions of culture and high contributions to the world in literature, arts, science, and social progress. One hundred million Europeans have fallen victims to this levelling process. It is impossible to estimate how much irreparable harm has been done to the intellectual and spiritual qualities of these people. Should the Russian occupation continue indefinitely it can be predicted with a degree of certainty that they will grow more and more to resemble their Russian comrades in slavery.

Discussion

It is, of course, impossible in the space of one article to cover adequately the significant features of even one facet of a nation's historic record. It is hoped, nevertheless, that enough pertinent material has been presented to indicate a distinct trend and a pattern in the complicated mosaic of Russian life across the centuries. This trend can be defined as one toward an arbitrary supreme authority ruthlessly enforcing passivity and conformity in its subjects. Added to this there has been an insatiable thirst to spread

its domination to all peoples within its reach. The more ruthless the autocrat, the higher has been his niche in the esteem of the Russian people.

Two types of individuals have stood the best chance to survive in Russia—one, the ruthlessly aggressive, the other, the supinely passive. The first may be likened to the wolf, the second to the sheep. These qualities are relative and interchangeable depending on the situation. A lower official must play the part of the wolf toward his underlings and a sheep toward his superiors in accordance with the Pavlovian concept of the reflex of slavery.

It may be assumed *a priori* that qualities that are dangerous or disturbing to an autocrat are laudable in our sense of the word. Among them are love of freedom, respect for human dignity and values, tolerance for the opinion of others, a sense of justice, assertion of the right to be different, and faith in spiritual values transcending material boundaries and restraints. The happy genic constellations producing a harmonious intellectual and affective blending conducive to the evolution of such human qualities are not too generously distributed in a given segment of the population. The more nearly perfect their manifestation, the rarer and more precious their incidence. Since heredity plays a basic role in the spread of mental abilities, it follows that systematic elimination of individuals possessing them to a high degree in one generation is likely to result in a decline in their incidence in the next. When the liquidation of free individuals had been applied mainly to men, as was the case in tsarist Russia, the genetic loss to the national stock could be made up, in part at least, by superior women. Protection of women and children has been an elementary rule of masculine chivalry and respect for the female and the young by the male is instinctive in the animal kingdom. Unfortunately, Communist Russia has chosen to disregard even this biologic principle and condemns women and children to slave labor camps almost on a par with men.

There has been a great concern in the world about the theoretical danger to the germ plasm from nuclear explosions. At the same time curiously little has been said or done about the continuous debasement of human qualities in areas under Russian control. Since the type of selection practiced there is directed exclusively toward inhibition of certain beneficent mental qualities, I have taken the liberty to introduce a new word which, I think, properly symbolizes its meaning. The word is phrenophagia (*phren*—mind, *phagein*—to eat up devour, consume, waste). Phrenophagia is more than "brain washing." It refers specifically to the effect upon future generations of systematic elimination in the reproductive period of the lives of individuals endowed with superior intellectual, humanistic, and spiritual qualities.

Russians, who have dethroned God, have erected new temples crowned with a deity called materialism. The high priests officiating in these temples are their scientists and technologists. They hold a position in Russia second only to the oracular Marxian hierarchy. For this reason, Russians have been particularly sensitive to the opinions of scientists even beyond the iron curtain. Perhaps here lies the key that may open the way to arrest or at least decelerate the malignant process of phrenophagia. As a practical step, one may suggest the creation of a commission composed of leading sociologists, anthropologists, geneticists, psychologists, psychiatrists, and historians. The purpose of this commission would be to conduct a searching inquiry into the morbid process of phrenophagia wherever it may be found. Exhaustive, carefully documented report of such a commission may even open the eyes of many Rusians themselves who have not yet become permanently possessed with the paranoid frenzy to robotize mankind.

Summary

A process of human artificial selection has been described as it has been practiced for many generations in areas of the world under Russian control. In essence, the process consists of suppression and liquidation of individuals whose personalities and convictions are incompatible with slavish conformity to an arbitrary supreme authority. The essential continuity of this process through Tsarist and Communist periods of Russian history has been traced. The word phrenophagia is

proposed to symbolize it. The grave implications of phrenophagia to mankind are stressed and one remedial measure is proposed.

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INTRACRANIAL TUMORS FOUND AT AUTOPSY IN MENTAL PATIENTS

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The purpose of this paper is to report the incidence and kind of intracranial tumors found in 2,161 autopsies performed in a large state mental hospital. Additional studies of this kind found in the literature are summarized in Table 1. In all the autopsies here reported the brain was examined. The incidence of intracranial tumors was much the same in all, except Larson's(23) small group. His tumors included small aneurysms and choroid plexus cysts not included in the other series. This accounts, to some extent, for his higher incidence. In Zfass and Riese's (32), and Crumpacker and Riese's(11) series autopsies were done in about 45% of deaths and in Braatelein and Gallavan's(10) 33.1%. Davidoff and Ferraro(13) found 90 brain tumors in 1,450 brains submitted to the New York State Psychiatric Institute. These came from mental patients but did not represent a continuous series of brains removed at autopsy.

Reports of intracranial tumors found at autopsy in nonmental patients are summarized in Table 2. Here the figures show similar patterns, except in Earle's(15) report from Veteran's Center in Los Angeles. In this series of 3,901 autopsies on males there were 1,498 cases of malignant neoplasm; 167 of his 266 intracranial tumors were metastatic. This gives an unusually high incidence (62%) for this kind of tumor in a series of intracranial neoplasms. These series differ fundamentally from the mental hospital groups in that the brain was examined much less frequently in the nonmental patients. In Garland and Armitage's (18) report 27.2% of the autopsies had the brain examined, in Peers' (28) 48.6%, and in Earle's(16) about 50%.

The total number of autopsies reported in Table 1 is 7,519. In these, 278 intracranial tumors were found for an incidence of 3.70%. In Table 2 the totals are 77,258 autopsies and 1,815 tumors for an incidence of 2.35%. Statistical examination of these data reveals a significant difference in the incidence of intracranial tumors in the two groups. From the data examined it can be stated that intracranial tumors are found at autopsy more frequently in mental hospitals than in nonmental hospitals. Since in many of the autopsies done on nonmental patients the brain was not examined some intracranial tumors were missed.

TABLE 1

INCIDENCE OF INTRACRANIAL TUMORS AT AUTOPSY IN MENTAL PATIENTS

Hospital and author	Autopsies	Tumors	Percent
St. Elizabeths Hospital: Blackburn(9)	1,642	29	1.7
St. Elizabeths Hospital: Hoffman(21)	2,000	69	3.4
Western State Hospital: Larson(23)	223	30	13.5
Eastern State Hospital: Zfass and Riese(32) and Crumpacker and Riese(11)	325	18	5.5
Colorado State Hospital: Braatelein and Gallavan(10)	1,168	54	4.6
Western State Hospital: Patton and Sheppard	2,161	78	3.6
Totals	7,519	278	3.7

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TABLE 2

INCIDENCE OF INTRACRANIAL TUMORS AT AUTOPSY IN NONMENTAL PATIENTS

Hospital and author	Autopsies	Tumors	Percent
Leeds General Infirmary: Garland and Armitage(18)	13,000	264	2.0
Boston City Hospital: Peers(28)	10,592	184	1.7
U. of Texas Hospital: Galveston, Earle(16)	9,720	254	2.6
V.A. Center, Los Angeles: Earle(15)	3,901	266	6.8
Los Angeles County General Hospital: Courville(8)	40,000	847	2.1
Totals	77,258	1,815	2.35

TABLE 3

KIND AND INCIDENCE OF INTRACRANIAL TUMORS FOUND AT AUTOPSY IN NONMENTAL HOSPITAL PATIENTS

	Garland and Armitage(18)		Courville(8)		Peers(28)		Baker(5)		Cushing(12)		Soniat(31)		Grant and Sayers(20)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Gliomas	95	36.0	299	35.3	81	44.0	381	50.3	862	42.6	88	68.7	482	54.1
Pituitary adenomas	3	1.1	45	5.3	6	3.3	28	3.7	360	17.8	1	0.7	80	9.0
Meningiomas	16	6.0	104	13.3	18	9.8	122	16.2	271	13.4	23	18.0	142	15.9
Neuromas	4	1.5	16	1.9	4	2.2	10	1.3	176	8.7	8	6.2	38	4.3
Congenital tumors	8	3.0	12	1.4	8	4.4	22	2.9	113	5.6	—	—	49	5.5
Metastatic	36	13.6	223	26.3	33	17.9	110	14.5	85	4.2	(not incl.)		42	4.7
Granulomas	90	34.0	116	13.7	19	10.3	31	4.1	45	2.2	—	—	8	0.9
Blood vessel tumors	3	1.1	12	1.4	5	2.7	37	4.9	41	2.0	3	2.3	20	2.2
Sarcomas	—	—	—	—	—	—	—	—	14	0.7	3	2.3	3	0.3
Papillomas	—	—	—	—	—	—	—	—	12	0.6	1	0.7	9	1.0
Miscellaneous	9	3.4	20	2.4	10	5.4	16	2.1	44	2.2	1	0.7	18	2.0
Totals	264		847		184		757		2,023		128		891	

Reports of the kind of tumors found in several series with the incidence of each kind are given in Tables 3 and 4. Three types of institutions are represented in these reports: neurosurgical clinics, general hospitals, and mental hospitals. Representing the first of these are the reports of Cushing(12), Soniat (31), and Grant and Sayers(20). Cushing's series shows a relatively high incidence of pituitary adenomas because of his group's special interest in these tumors. The incidence of metastatic tumors is low from neurosurgical clinics since surgeons are usually reluctant to operate on cases of intracranial metastases.

Reports from general hospitals show uniformity in the incidence of the various kinds of tumors. In Garland and Armitage's(18) series there were 34% granulomas (90 granulomas, 89 of which were tuberculomas) which is somewhat higher than the incidence of this type of tumor in the other series.

Even though some of the series are small there is uniformity in the incidence of the various kinds of tumors reported from mental hospitals. The only striking difference noted in comparing the mental patient and nonmental group is in the incidence of meningiomas. In the former, 107 of these tumors were found and these made up 33.2% of all of the intracranial tumors of mental patients. In the nonmental patients 696 meningiomas were found making up 13.66% of all of the tumors. Statistically the difference in these 2 groups was found to be significant. Thus this tumor occurred with greater frequency in mental patients. Many of these were small and represented incidental findings at autopsy. Thus perhaps the higher incidence of meningiomas in mental

TABLE 4

KIND AND INCIDENCE OF INTRACRANIAL TUMORS FOUND AT AUTOPSY IN MENTAL HOSPITAL PATIENTS

	Zfass and Riese(32), Crumpacker and Riese(11)		Hoffman(21)		Larson(23)		Davidoff and Ferraro(13)		Braatelein and Gallavan(10)		Patton and Sheppard	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Gliomas	7	38.9	13	18.8	4	13.3	36	48.0	11	20.4	25	32.0
Pituitary adenomas	1	5.5	4	5.8	4	13.3	7	9.3	4	7.4	7	9.0
Meningiomas	5	27.8	32	46.4	8	26.6	23	30.6	20	37.0	19	24.4
Neuromas	—	—	2	2.9	—	—	2	2.6	3	5.6	3	3.8
Congenital tumors	—	—	—	—	—	—	3	3.9	1	1.8	4	5.1
Metastatic	1	5.5	18	26.1	2	6.6	2	2.6	9	16.7	12	15.4
Granulomas	3	16.7	(not incl.)		4	13.3	2	2.6	1	1.8	5	6.6
Blood vessel tumors	—	—	—	—	2	6.6	—	—	4	7.4	1	1.3
Papillomas	—	—	—	—	4	13.3	—	—	—	—	—	—
Miscellaneous	1	5.5	—	—	2	6.6	—	—	1	1.8	2	2.6
Totals	18		69		30		75		54		78	

patients lies in the fact that brain examination is a routine part of the autopsy on these patients. On the other hand McIntyre and McIntyre(26) state, "The most common tumor producing mental symptoms is . . . the meningioma, a benign operable tumor." Naumann(27) reported that meningiomas are 4 times as common in psychotic patients as in general hospital patients. Meningiomas frequently involve the frontal lobes and Soniat(31) found that 71% of patients with frontal lobe tumors exhibited psychiatric symptoms.

Further information regarding the relative frequency of intracranial tumors is obtained from Kernohan and Sayre(22) who state:

> In recent years about 9% of all neoplasms removed surgically at the Mayo Clinic were located in the central nervous system or its coverings, the meninges. . . . about 80% were located in the cranial cavity.

Bailey(3) estimated that 1.8% of all malignancies arise in the brain and Ewing(17) that about 1% of deaths are caused by brain tumor.

Method and Material

For the purposes of this report intracranial tumors are: neoplasms, granulomas, and congenital tumors found within the cranial cavity.

Our group is composed of patients autopsied at the Western State Hospital during the period October 1, 1938, to October 1, 1954. In this period there were 5,188 deaths and 2,230 autopsies, giving an autopsy rate of 43%. In 28 instances the records are incomplete and in 41 autopsies the brain was not examined. The remaining 2,161 autopsies were used in this study and in them 78 intracranial tumors were found for an incidence of 3.6%. All the tumors were verified histologically except for 6 of the meningiomas. The 78 tumors were found in 77 different patients. In one patient both a meningioma and a vascular tumor were found. There were 41 women and 36 men in the group. The population of this hospital is almost exclusively adult and the average age of the individuals with tumors was 60.1 years.

A report of the tumors found in each category follows:

Gliomas.—Twenty-five tumors of this kind were found constituting 32.0% of the total. They were classified histologically using the method described by Kernohan and Sayre (22). In this system the terms spongioblastoma polare, glioblastoma multiforme, and astroblastoma are not used. These authors feel that gliomas arise from adult cells which have undergone a process of dedifferentiation and proliferation. They, therefore, use the terms astrocytoma, grade 1, 2, 3, or 4, depending on the degree of malignancy present. These terms correspond respectively to Bailey and Cushing's(4) astrocytoma, astroblastoma, and spongioblastoma (glioblastoma) multiforme.

The twenty-five gliomas were classified as follows: astrocytomas, grade one (2), grade two (4), grade three (6), grade four (8), oligodendrogliomas (2), ependymomas (2), and medulloblastoma (1).

The medulloblastoma was found in a 39-year-old woman in the vermis and left cerebellar hemisphere. Two of the gliomas of low-grade malignancy occurred in the midbrain. One of these occluded the aqueduct of Sylvius and the other extended into the interpeduncular fossa on a short pedicle.

Gliomas were found in patients ranging in age from 22 to 81 years, the average age being 55.2 years. Sixteen men and 9 women are in the group. Astrocytomas, grade 1, 2, and 4, were found respectively in patients of 79, 78, and 81 years.

Pituitary Adenomas.—Seven adenomas of the anterior lobe were found making up 9.0% of all tumors. An eosinophilic adenocarcinoma of the hypophysis is present in this group which has been reported by Snyder and Larson(29). Of the remaining 6 tumors 5 were chromophobe adenomas, and the other was an eosinophilic adenoma. The chromophobe adenomas varied in size from 3.5 to 5.6 cm. in largest diameter. The eosinophile adenoma was 3.2 cm. in diameter. The average age of the patients with pituitary adenomas was 61 years and the age range was 51 to 79 years. The sex incidence was 4 to 3 with females predominating.

Meningiomas.—Nineteen meningiomas were found and these constituted 24.4% of

the intracranial tumors. The size ranged from 6 x 6 x 10 mm. to 85 x 60 x 60 mm. One large meningioma weighed 245 gm. An interesting case of meningeal tumor that had metastasized to the lungs is included in this group. It has been fully described by Dublin (14).

These tumors were found in the following locations: 6 in the frontal region, 3 in the olfactory groove, 3 in the suprasellar region, and 2 each in the parietal and occipital areas. The location of 3 tumors was not given. Meningiomas were found in patients ranging in age from 34 to 84 years, the average age being 67.9 years. Sex incidence was 14 to 5 with females predominating. Peers(28) found that females outnumbered males in a ratio of 5:1 in his series of 18 meningiomas. The peak incidence for these tumors in his series was in the fifth decade.

Neuromas.—Three acoustic neuromas were found, all in the left cerebellopontine angle. They were in men aged 59 and 73 and in a woman of 53. The largest diameter of these tumors was respectively 2.4, 4, and 5 cm.

Congenital Tumors.—These 4 were a colloid or paraphysial cyst of the third ventricle, 2 craniopharyngiomas and an epidermoid cyst. The colloid cyst was in a 75-year-old man and the craniopharyngiomas in a 40-year-old woman and a 44-year-old man. The epidermoid cyst was in the third ventricle in a 23-year-old woman where it had caused blockage of the interventricular foramina and internal hydrocephalus.

Metastatic Tumors.—Twelve tumors in this category were found making up 15.4% of the total. These tumors were metastatic from primary malignancies of the bronchus in 5 cases, the breast in 4, the kidney in 2, and the uterus in one instance. All were carcinomas except the last which was a leiomyosarcoma. This tumor had metastasized to the abdominal viscera, lungs, heart, and left axilla as well as to the brain.

Madow and Alpers(25) have described an encephalitic form of metastatic carcinoma. In their 4 cases no common clinical features were noted. Pathological examination of the brains revealed no gross metastases but microscopic meningeal and parenchymal metastases were seen in many parts. These authors estimate that this form of metastatic brain lesion occurs in 3% to 4% of metastatic carcinomas of the brain. In the present series 3 cases of this kind were found, having metastasized from the bronchus in 2 cases and the kidney in the other.

Metastases reach the brain via a hematogenous route since there are no lymphatics in the brain. Most investigators state that the spread to the brain is via the arteries. Malignancies of the lung, either primary or secondary, invade a pulmonary vein and tumor emboli are carried to the left heart. From here they pass into the systemic circulation and reach the brain. However, there are cases in which no pulmonary tumor is found. In these it has been suggested that the tumor emboli pass through the pulmonary capillary bed without growing as metastases in the lung or that the tumor fragments reach the systemic circulation as "paradoxical" emboli through a patent foramen ovale or ventricular septal defect. Earle(16) states that careful examination of the lungs will reveal small foci of metastatic involvement which could easily be overlooked. He feels that in most cases metastases reach the brain from a focus in the lungs that has invaded a pulmonary vein. Another hematogenous route of metastasis to the brain has been suggested by Batson(7) and Anderson (1). These investigators showed that the vertebral plexus of veins has many anastomotic connections with visceral venous plexuses, intercostal veins, and with the cranial dural venous sinuses. Anderson showed in the living subject that increase in intra-abdominal and intrathoracic pressure causes retrograde flow in the vertebral plexus. Material injected into the femoral vein was demonstrated in the dural venous sinuses and in the internal cerebral veins. The route was shown to be via the vertebral venous plexus. Even though there is convincing anatomical evidence that metastases could reach the brain via this route, several observers(10, 19, and 28) feel that it rarely if ever is responsible for intracranial metastases. Commonly, these are in the brain parenchyma, frequently at the junction of cortex and white matter and the dural venous sinuses are rarely invaded. This is presented as evidence for arterial spread and against spread via the vertebral

venous plexus. However, Anderson's experiments show that material coming to the brain via the vertebral plexus does enter the internal cerebral veins. Thus intracerebral metastases could reach the brain via this route. In those cases in which no pulmonary tumor is found it seems more logical to accept this as the route of cerebral metastases than to invoke "paradoxical" embolism or to present an explanation based on the passage of tumor emboli through the pulmonary capillary bed.

Table 5 shows the occurrence of intracranial metastases from various primary malignancies in series of metastatic brain tumors. It is evident that 40% to 50% of intracranial metastases originate from primary tumors in the bronchus and breast.

In patients dying of malignant disease, Earle(15, 16) found in 2,208 autopsies that 11% had intracranial metastases. Lesse and Netsky(24) found 32% in 595 autopsies in malignant disease. Other investigators (cited in 6) reported lower incidence of intracranial metastases in malignant disease. To find brain metastases thorough examination is necessary since many times only microscopic foci are present.

The metastatic tumors reported in this paper occurred in patients ranging in age from 41 to 76 years. The average age was 62.2 years and an equal number of men and women were involved. In 6 cases metastases were multiple, in 2 they were single, in 3 there was diffuse microscopic involvement with no gross metastases and in the last case only the dura of the middle cranial fossa was involved.

Granulomas.—These were found in 5 instances; 2 of them were tuberculomas and 3 were gummas. One of the latter has been described by Snyder and Rickles(30).

At the end of the nineteenth century tuberculomas constituted 50% of the new growths of the central nervous system. They now constitute 1.5 to 3.6%(2).

The tuberculomas were found in women aged 31 and 60 years. The tumors measured in their largest diameter 2 cm. and 0.5 cm. respectively. They were in the cerebrum in both instances. The gummas were found in 55- and 64-year-old women and in a 68-year-old man. These 3 tumors were in the cerebrum, 2 were in the frontal lobes and the other involved the left basal ganglia, thalamus, and cerebral peduncle.

Blood Vessel Tumors.—One of these tumors, an arteriovenous angioma, was found. It occupied a 3-cm. area in the right lentiform nucleus and white matter beneath the island of Reil in an 84-year-old woman. In this patient a small meningioma was also found near the midline in the left parietal region.

Miscellaneous Tumors.—Two osteomas of the inner table of the skull are included in this category. These were both in the frontal region and both caused depression of the underlying cerebral cortex. One of these measured 4.5 cm. in diameter and it was raised 1.5 cm. above the level of the adjacent frontal bone. In the other case there were 2 bony protusions of the inner table measuring 2 cm. across and 1 cm. in elevation above the level of the inner table.

Summary

The intracranial tumors found at autopsy in 2,161 mental patients are reported. This group represents 96.9% of all patients who were autopsied at the Western State Hospital during the 16-year period from October 1, 1938, to October 1, 1954. Seventy-eight

TABLE 5

Percentage Representation of Various Primary Malignancies in Series of Intracranial Metastatic Tumors

Primary site	Percent of all intracranial metastases				
	Baker(6)	Lesse and Netsky(24)	Earle(16)	Courville(8)	Globus and Meltzer(19)
Lung and bronchus	21%	26%	30%	39%	43%
Breast	21	36	8	10	—
Kidney	8	5	1	3	7
Skin (incl. melanoma)	8	—	10	3	7
G-I tract	11	6	—	6	14

intracranial tumors were found for an incidence of 3.6%. The incidence of the various kinds of intracranial tumors found is discussed. These incidences are compared with reports of similar autopsy series in both mental and nonmental patients. The data examined reveal a significantly higher incidence of intracranial tumors and of meningiomas in mental patients than in nonmental patients. The greater incidence of meningiomas in mental patients is partly responsible for the greater incidence of intracranial tumors in this group. Meningiomas are frequently asymptomatic and may only appear to be more frequent in mental patients since at autopsy the brain is routinely examined whereas in autopsies of nonmental patients the brain is frequently left undisturbed. Thus many asymptomatic meningiomas in nonmental patients are overlooked at autopsy. Against this are observations that meningiomas frequently produce only psychiatric symptoms. Thus patients harboring one of these tumors tend to gravitate to psychiatric hospitals and not to general hospitals or neurosurgical units.

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ARMY PSYCHIATRY IN KOREA FOLLOWING THE CEASE FIRE AGREEMENT

II. A Follow-up Evaluation of 133 Psychiatric Patients from Units Other than the Third Infantry Division

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The methods and goals of army psychiatry had been clearly defined by the end of the Korean conflict. Higher echelons had established the policy of not evacuating men because of psychiatric disabilities except for the grossly psychotic who could not be rehabilitated. Psychiatrists at the lower echelons were obliged to carry out this policy whether or not they agreed with it. We knew that men with psychiatric difficulties could be returned to duty and that we could refuse to evacuate. We did not know what happened to these men and their local units after they had been returned. If men were being evacuated through other medical channels the psychiatric statistics had little meaning. If the men we refused to evacuate functioned poorly and/or led to decreased efficiency of their unit, our policies were not sound regardless of the statistics. The present study was designed to seek answers to these questions.

During the 7-month period from September 1953 through March 1954, the neuropsychiatric section, 3rd Infantry Division evaluated 340 patients of whom 327 were American soldiers. The purpose of this paper is to present the results of a follow-up investigation of the 282 patients for whom such information was obtainable.

In an earlier paper(1) we reported the results of a study of 149 patients from within the 3rd Infantry Division. The present report adds 20 patients from the Division and 113 from adjacent units. It was not possible to obtain follow-up information on 45 patients.

METHOD

The follow-up data for these additional 133 patients was obtained by sending a questionnaire to the commanding officer of each patient. This is in marked contrast to the earlier study in which the company commander was personally contacted.

Questionnaires were sent out during the first 2 weeks of April 1954 for 114 patients (94 replies) and during the first 2 weeks of June 1954 for 64 patients (39 replies). In many cases 2 and 3 questionnaires had to be sent to a unit before a response was obtained.

The information obtained included a rating of the man's performance of duty by his unit commander. The ratings used were: excellent, good, adequate, poor, or intolerable. Information was also obtained regarding promotions or reductions in rank; the presence of nervousness, physical complaints, or behavior difficulties; opinion regarding the individual's effectiveness as a soldier; whether or not the man had been in any disciplinary difficulties; and the number of days that he had been absent from duty because of hospitalization, light duty slips, or other medical reasons.

In the case of men no longer on duty in the unit who had rotated from Korea, been discharged from the army, or sent to the stockade, we obtained the date of the change in status, the regulation authorizing the change, and the orders responsible for it. In most instances the battalion surgeon also commented on the individual's adjustment, and the number of times he had been on sick call, the reasons for these visits, and the findings.

After the data had been gathered it was apparent that the ratings given by the commanders summarized the information. Therefore the data have been considered in terms of these ratings. The validity of these ratings was considered in an earlier paper(1). The same comments and criticisms of the method presented in the first paper are applicable here. In addition, the present study utilizes the questionnaire rather than personal contact.

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Since there was relatively little difference among the 3 groups rated "adequate," "good," or "excellent," they have been combined into one group as having performed duty "adequately or better." The groups rated "poor," and "intolerable" were also combined. These were men who presented serious problems to their commanders who stated that they "cannot be depended upon," that they "refuse to work," and they "disobey orders." This group had a much higher incidence of courts martial and of company punishments. The majority of the men in the "poor" group had been disciplinary problems for command.

In our earlier study about 10% of the ratings were found to deviate from the other comments made by the commanders. In the present group 4 of the 76 men potentially remaining on duty seemed to be rated one rating too high when the actual rating was compared with the other comments of the commanding officers; 2 men were rated good whose performance might be more accurately described as adequate; 2 were rated adequate whose actual performance appeared to have been poor.

The mean time length between the patient's visit and the date of his change in status or follow-up was 3.6 months; the median was 3.0 months. As in the previous study the adequacy of duty of those patients followed less than 3 months and those followed more than 3 months is not significantly different. In fact, there were more men doing duty that was rated adequate or better in the group followed the longer. Thus, while many of our follow-up evaluations cover a relatively brief time span, the results would probably not be greatly different had longer time elapsed.

While only 2 of the 149 patients in the former report had been in Korea more than 12 months at the time of consultation, 15% of these added 133 patients had been in Korea over 1 year. This difference is due in part to the shorter tour for division troops who more rapidly accumulated points toward rotation. This may also indirectly be a reflection of personality disorders in that those unable to adjust are often assigned to a rear area where there is likely to be less stress. Of the 20 patients who had been in Korea more than 12 months at the time of evaluation, 12 were referred as part of the procedure necessary for administrative separation. This suggests that another reason for their longer tours may have been the accumulation of "bad time" in the stockade which of course was not credited toward rotation.

Fifty-eight individuals (44% of those in the study) had been either medically or administratively separated from service or sent to the stockade at the time of the follow-up evaluation (Table 1). At first glance this loss of 44% of the population suggests a very poor result. Study of the 58 individual cases, however, reveals that 57 of these patients were in the process of being separated at the time of the consultation and thus do not actually represent failures. Only 37 (or 25%) of 149 patients in the first report were in the process of separation at the time of evaluation. The larger figure in the present study reflects the greatest difference in the 2 populations. Since the division psychiatrists function as an integral part of the medical and administrative organization of the division, patients can be readily referred through existing channels. The 113 nondivision patients, however, were referred from 45 different, independent units that were assigned to IX Corps, 8th Army, 2nd Division, and 40th Division. In such instances communication was often difficult and travel extensive. Consequently these units usually referred only those cases where some definite action was contemplated. When this group of patients who were administratively discharged is deleted from both populations, the results for the 2 are not significantly different.

All of the patients who received administrative discharges and all 6 patients with this form of discharge pending at the time of follow-up were referred with the request that medical clearance be given for some form of discharge.

Of the 14 patients who were in the stockade at the time of the follow-up evaluation, 12 were referred, after court martial charges had been preferred, for an opinion regarding mental responsibility, one was referred with a request for medical clearance prior to administrative separation, and the other was referred because of his use of physical complaints to avoid service. Thus all the patients

TABLE 1

FOLLOW-UP RESULTS OF 133 PATIENTS

(Percentages calculated for 76 patients not in process of separation at time of psychiatric consultation (see text).)

	Number of patients in process of separation at time of psychiatric consultation	Number of patients not in process of separation at time of psychiatric consultation	Rated good or better Percent	Rated adequate Percent	Rated poor Percent	Unknown Percent	No longer on duty Percent	Total patients in study
On Duty								
Rated excellent	—	12	15.8	—	—	—	—	12
Rated good *	—	19[a]	22.4	2.6	—	—	—	19
Rated adequate †	—	15[b]	—	14.5	2.6	—	—	13
Rated poor	—	7	—	—	9.2	—	—	7
Rotated from Korea								
Rated excellent	—	3	4.0	—	—	—	—	3
Rated good	—	4	5.3	—	—	—	—	4
Rated adequate	—	3	—	4.0	—	—	—	3
Rated poor	—	4	—	—	5.3	—	—	4
Rated unknown ‡	—	10[c]	—	6.6	—	6.6	—	10
Sentenced to stockade	14	—	—	—	—	—	—	14
Discharged for unfitness (AR615-368)	14	—	—	—	—	—	—	14
Discharged for unsuitability (AR615-369)	5	—	—	—	—	—	—	5
Administrative discharge pending	6	—	—	—	—	—	—	6
Discharged for homosexuality (AR600-443)	6	—	—	—	—	—	—	6
Evacuated through neuropsychiatric channels	12	—	—	—	—	—	—	12
Evacuated through medical channels	—	1	—	—	—	—	1.3	1
Total	57	76	47.5	27.7	17.1	6.6	1.3	133

* Two of these actually seem adequate.
† Two of these actually seem poor.
‡ Data suggests these probably are 5 adequate and 5 unknown.

in the stockade at the time of the follow-up were in some form of administrative difficulties at the time of consultation.

In Table 1 the data are presented in terms of the 76 patients returned to duty who might reasonably have been expected to continue on a duty status. Of this group only 1 was no longer on duty status at the time of follow-up evaluation. This individual was evacuated through medical channels. This very likely represents a by-passing of psychiatric facilities. He had been doing very poor duty prior to psychiatric evaluation due to a character disorder.

Of the patients not in the process of separation at the time of evaluation, 75% performed duty "adequately or better" following psychiatric consultation; 17% were rated "poor"; 6% were not rated. Of the 13 patients who were rated as "poor," 8 were described by their commanders as poor soldiers prior to psychiatric evaluation and the other 5 had been given certificates for administrative separation.

EVALUATION OF PATIENTS GIVEN CLEARANCE FOR DISCHARGE FOR UNFITNESS (AR615-368)

Twenty-four patients were certified for administrative separation for unfitness (AR 615-368). All were described as poor soldiers by their unit commanders at the time of consultation and in each of the cases the certification was specifically requested by the commander. All of these 24 patients had been administratively separated from their units at the time of the follow-up evaluation: 20 had been discharged as unfit; 2 as unsuit-

able; 2 were in the stockade. This is in marked contrast with our study of referrals from within the division(1) where over half of the patients given psychiatric clearance as unfit (AR615-368) remained on duty, and 7 of 19 were functioning "adequately or better." This difference apparently arises from the difficulties of referring nondivisional patients with the result that commanders outside the division requested certificates only when they actually intended to use them and did not use the certificates as a warning to the patient against future acting out, as was postulated for the commanders within the Division.

In 17 of the 24 instances in which commanders requested psychiatric clearance to discharge a man as unfit, the certificate was modified and an alternative disposition was suggested by the psychiatrist. These proposed that the man be continued on duty, reassigned, or separated as unsuitable. In 6 instances the certificate was accompanied by an explanation for the man's behavior, in the hope that it would be dealt with with understanding rather than with punitiveness. Fourteen of these 17 men were discharged as unfit; 1 was courtmartialed; 2 were separated as unsuitable but this was not the psychiatric recommendation in these 2 instances. Had a close-working relationship existed between the psychiatrist and the commanders such as existed within the division, the psychiatric reports might have been given more credence.

CLINICAL FINDINGS

The remainder of this paper considers the combined population of 282 patients from both studies. The frequency of the various presenting complaints was essentially the same for the 2 populations.

As stated in our earlier paper the questions a division psychiatrist meets most frequently from both commanders and his medical colleagues are related to the advisability of keeping men on duty who have various clinical syndromes which at first glance would appear incapacitating. Among battalion surgeons it has become a standing joke that psychiatrists send (almost) "everybody back to duty." We must continually ask ourselves if this is fair to the individual and at the same time fair to the other men in the patient's unit. Is it possible for men with rage reactions, epileptiform spells, and rather severe psychogenic somatic reactions to function adequately in an infantry division in the field?

The group which has caused everyone the greatest concern is composed of those individuals subject to rages. Many of these individuals have fired weapons during their tantrums and usually one has misgivings about returning such a soldier to full duty. What happens when these men are returned to their unit is a question: Fig. 1 groups the data in terms of the presenting complaints or reason for referral.

Of the 13 patients, seen because of rages, who were not facing court martial charges at the time of consultation, only one did poor duty subsequent to consultation and even this man did not cause or get into serious trouble. None of the patients in this group was considered "excellent" by his commanding officer, however all made satisfactory adjustments during the time that elapsed and apparently controlled their aggressive tendencies sufficiently to stay out of trouble.

Most of the patients referred as suicidal composed a group of individuals who used suicide as a threat. However, 6 were sent to Seoul for closed-ward observation. One of these was evacuated to Japan where he was reassigned; the others were returned to their units at the end of hospitalization and performed satisfactory duty; 2 were convicted by court-martial charges of attempting to avoid duty by self-inflicted wounds.

The most frequent presenting symptoms were those of general nervousness. These patients were nervous, moody, worrisome, tense, upset, anxious, sleepless, excitable, or unstable. While 2 of these 39 patients were psychotic and evacuated the day of consultation, 88% of the men in this group did well when returned to duty.

Most of the 19 patients with headaches performed duty adequately or better following psychiatric consultation. In fact, with very few exceptions, the patients with psychogenic, somatic complaints did satisfactory duty regardless of the nature of the complaint.

Figure 1 also summarizes the distribution of patients referred for psychiatric evaluation in an overseas infantry division.

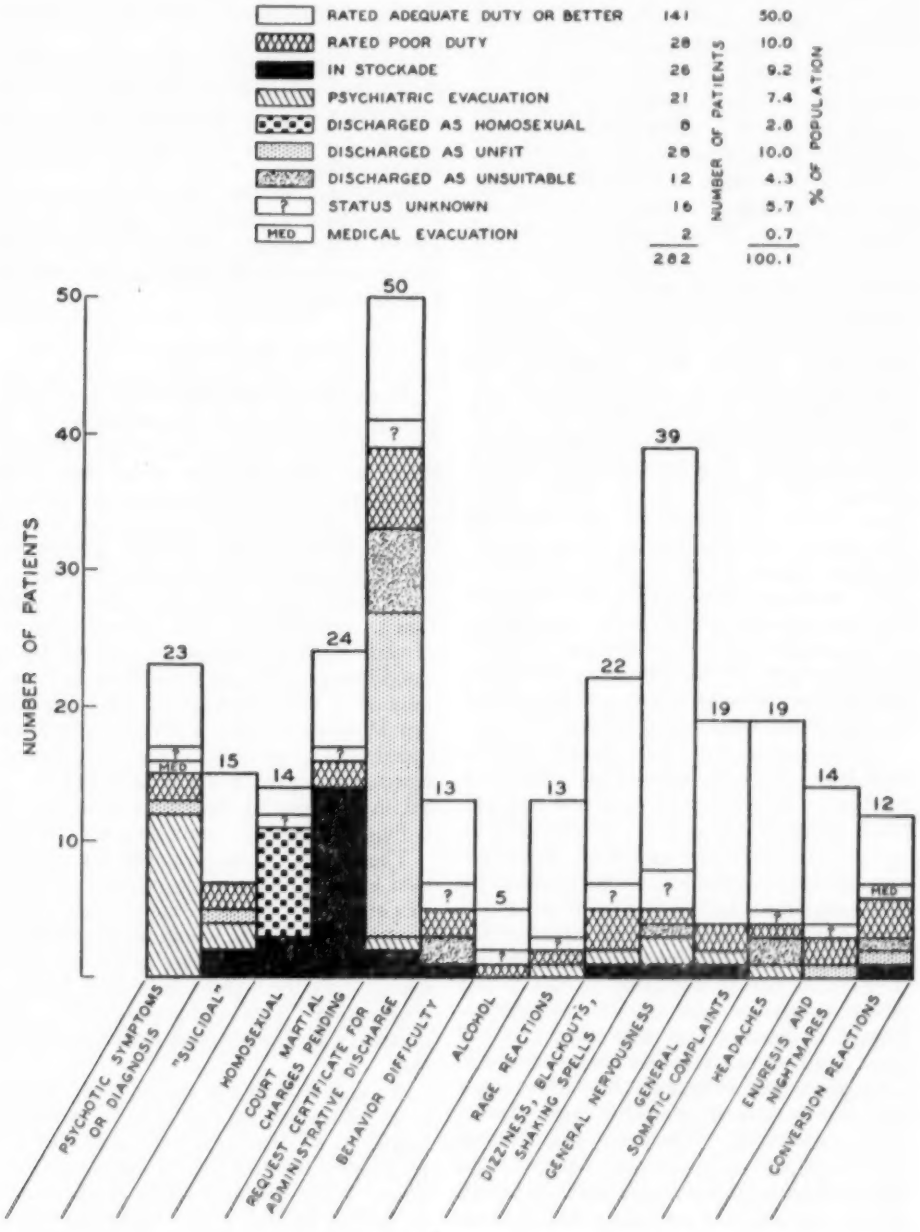
RATED ADEQUATE DUTY OR BETTER 141 50.0
RATED POOR DUTY 28 10.0
IN STOCKADE 26 9.2
PSYCHIATRIC EVACUATION 21 7.4
DISCHARGED AS HOMOSEXUAL 8 2.8
DISCHARGED AS UNFIT 28 10.0
DISCHARGED AS UNSUITABLE 12 4.3
STATUS UNKNOWN 16 5.7
MED MEDICAL EVACUATION 2 0.7
282 100.1
NUMBER OF PATIENTS
% OF POPULATION
NUMBER OF PATIENTS
50
40
30
20
10
23
15
14
24
50
13
5
13
22
39
19
19
14
12
PSYCHOTIC SYMPTOMS OR DIAGNOSIS
"SUICIDAL"
HOMOSEXUAL
COURT MARTIAL CHARGES PENDING
REQUEST CERTIFICATE FOR ADMINISTRATIVE DISCHARGE
BEHAVIOR DIFFICULTY
ALCOHOL
RAGE REACTIONS
DIZZINESS, BLACKOUTS, SHAKING SPELLS
GENERAL NERVOUSNESS
GENERAL SOMATIC COMPLAINTS
HEADACHES
ENURESIS AND NIGHTMARES
CONVERSION REACTIONS

FIG. 1

About 10-20% of the men were referred because of the possibility of a psychotic process. Some of them were referred to substantiate the diagnosis and to decide whether or not medical evacuation was indicated.

A large number of patients were also referred for the primary purpose of ruling out a psychotic process, particularly when the patient was facing court-martial charges.

A large proportion of referrals was initiated by commanders because of the patient's deviant behavior. The majority of these had a life-long history of poor adjustment with repeated episodes of acting out. Many seemed particularly sensitive to authority and their military adjustment was marginal throughout. Usually their commander had requested a statement regarding mental responsibility or a certificate that there were no medical contraindications to administrative separations. In a large number of these referrals the psychiatrist can render additional service by amplifying and clarifying extenuating and/or mitigating circumstances. Whether these professional opinions are given their due consideration depends in a large part on how receptive the commander is to psychiatric concepts, which, in turn, depends partially on his previous experience with both army psychiatrists as a group and the individual psychiatrist serving his unit.

Approximately half of the patients evaluated were referred because of subjective symptoms—both psychological and somatic. These men had been screened by the battalion surgeon and with the exception of self-referrals these consultations were requested by other physicians for further opinion regarding diagnosis or management. In most instances the symptoms resulted from the patient's difficulty in adjusting to life in the Army in Korea with all its implications. Figure 1 demonstrates that over 75% of these patients with subjective psychogenic complaints did adequately or better when returned to their units after a single psychiatric consultation. When we consider that these 282 patients had been screened from approximately 30,000 troups over a 7-month period, the policy of returning such patients to duty seems justified by the results.

Unfortunately, we did not accumulate data on a control population during the time of this study. However, such a control group with its inherent proportion of failures would have further emphasized the results of returning patients to duty who have subjective psychogenic complaints.

Thirty-one patients in the total population of 282 were referred on more than one occasion. The follow-up experience of this group was, on the whole, the same as that of the total population.

Predictions of the expected performance of duty were made for 28 patients in the group being added. The results and criticisms were essentially the same as those reported earlier.

Discussion

As we stated in the first paper on this subject, there are many opportunities to do follow-up studies in the army; however, there are also obstacles which necessitate compromises. The conscript army leads to frequent changes in duty assignments which make long-term studies difficult. The project which depends upon evaluations by company commanders must be limited either in duration or completeness and accuracy. In the present study 47 patients could not be located and 14 were not remembered. Practically all of these were from units outside the 3rd Division. Many of the units had been transferred to other areas and some had left Korea for Japan or the United States. To obtain meaningful follow-up data for the individuals in these units was not possible.

The length of time between the patient's visit and his follow-up is relatively short in this study. It was necessary to find a compromise period that would allow reasonable accuracy in the commander's reports and also enough time for a reasonably valid period of observation. This compromise was made necessary by the constantly shifting population.

As was true in the earlier study the criteria of success or failure here relate primarily to whether or not the man continued to function satisfactorily in the military situation. While this is a rather crude measure of mental health, it has important logistic significance and within limits the quality of an individual's performance of duty can be determined rather objectively. At the same

time it is a rather negative criterion of success in that an "adequate" soldier may primarily be an individual who does not get into trouble.

Generally patients with psychogenic somatic complaints did "good" duty. They did not complain or make pests of themselves and consequently were considered successes. However, many of them may have continued to have subjective discomfort which is not recorded in our data since the individual patients were not contacted, although both the commanding officers and the battalion surgeon were asked whether there was any evidence of continuing discomfort.

These patients have been maintained as functioning organisms in a military unit and in most cases the needs of the military had to be given precedence over the feelings of the individual. In combat this is necessary. In a more static truce situation it is also necessary to keep men functioning. To render them less uncomfortable in the process is desirable but a secondary goal. This study measures the results of the first of these goals much better than those of the second, although the results do suggest that our patients did make better adjustments and, in most instances, were less uncomfortable following psychiatric consultation.

It was surprising to learn from the various company commanders that the results of seeing a patient in a single consultation were much greater than was expected. The company commanders felt that there had frequently been a beneficial change in the patients and the degree of this change far exceeded anything that might be directly attributed to the consultations.

Commanding officers have reported that they may have taken a different attitude toward a man who had been referred to a psychiatrist. This may have been due at times to seeing the report of consultation, or at other times may have been merely the result of knowing that the patient had been to see a psychiatrist and should, therefore, be treated with special consideration. This change of attitude on the part of the commanding officer may have been reflected in the generally favorable ratings they gave and some of these ratings may have reflected more the change in the commander's feeling than any actual change in the patient's adjustment. While there are many such potential defects in the validity of rating scales such as those used in this study, this method was the best available under the circumstances and, in spite of its defects, has provided a rough assessment of the relationship between the patient and his commander which is of prime importance in a military situation.

It would seem that many of the beneficial results of psychiatric consultation in the army are determined in large part by the nonspecific effects that result from going or being sent to a psychiatrist, independent of any specific therapeutic attempts on the part of the psychiatrist. The figures presented in this paper should serve as a control in any study that reports a high degree of success resulting from a specific treatment program in the realm of military psychiatry.

Summary

Follow-up findings of 133 psychiatric patients evaluated between September 1953 and March 1954 from miscellaneous units surrounding the psychiatric section, 3rd Infantry Division, reveal that 75% of patients not in the process of separation at the time of consultation functioned adequately or better after the consultation.

Forty-four percent of the population had been separated from the service at the time of the follow-up. This was primarily due to patients referred from units outside the 3rd Division. Certification for administrative separations was utilized in almost all instances in which it was given.

This population of 133 patients is compared with a previously published report of 149 patients from units within the 3rd Infantry Division.

Follow-up results of these 282 patients are examined in terms of presenting complaint or reason for referral. Seventy-five percent of patients with subjective, psychogenic complaints functioned adequately or better when returned to duty after a single consultation.

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AN OPERATIONAL CONCEPTION OF CRIMINAL RESPONSIBILITY

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In the Isaac Ray Award book, *The Psychology of the Criminal Act and Punishment*, Gregory Zilboorg summarizes a long-standing situation regarding criminal responsibility:

> . . . yet no solution of the problem has yet been found. We all, or almost all, agree that the method under discussion is deficient, but no sufficiently workable change has as yet been suggested. Here is an example of our earnest but inefficient groping in the matter.

This passage describes a kind of puzzlement we feel when attempting to solve a problem without adequate conceptual tools—the kind of puzzlement we might feel, for example, in trying to solve problems regarding motion without knowing the concept of acceleration. The example of inefficient groping referred to was a fairly recent suggestion by a leading physician in England:

> The time is surely come to determine afresh in what circumstances mental illness should mitigate criminal responsibility.

Like most of our endeavors in this area, this suggestion directs our attention toward establishing new criteria for determining criminal responsibility rather than toward investigating the logical content of the concept of criminal responsibility itself. This venerable concept has remained essentially unanalyzed since our ancestors first formulated it. We cannot hope to dispel the appalling prejudice that envelops this subject until we have attained a logical analysis of criminal responsibility which places us on firm theoretical ground. This article attempts such an analysis.

The Monte Durham Decision, recently rendered by the District Court of Appeals of the District of Columbia, holds that a person whose criminal act was the result of mental illness or defect cannot be regarded as criminally responsible. The court was explicit in its statement that establishing criminal responsibility has always been concerned with rendering a moral judgment of the criminal:

> . . . we permit it [the jury] to perform its traditional function which . . . is to apply our inherited ideas of moral responsibility to individuals prosecuted for crime. Juries will continue to make moral judgments still operating under the fundamental precept that "our collective conscience does not allow punishment where it cannot impose blame."

The sequence to judgment is this: If an individual is criminally responsible, he is morally responsible, and if he is morally responsible he can be judged morally guilty. Consequently a judgment of guilty currently means 2 things: (1) The accused committed the crime; (2) the accused was morally guilty in committing the crime. All of the law's endeavors to establish criteria for determining criminal responsibility, from the M'Naghten rule to the Durham decision, have as their purpose the selection of those who can be appropriately subjected to a moral judgment. In its historical context, criminal responsibility is equatable to moral responsibility, an idea having a metaphysical content dealing with free choice between the values of good and evil or a theologic content dealing with the struggle between heaven and hell.

Whatever the necessity of values and value judgments in guiding human endeavor, the mundane task of administering the law constitutes an operation exclusively confined to the natural world of cause and effect. In such a situation, trying to use a metaphysical or theological concept like moral responsibility will inevitably prove embarassing. The bankruptcy of our present position in this regard is exemplified by the following two quotations from prominent legal minds. The first advocates an ostrich position in the sands of action:

> From any objective point of view the escape of the law from reality constitutes not its weakness but its greatest strength. If judicial institutions become too sincere, too self-analytical, they suffer the fate of ineffectiveness which is the lot of all self-analytical people.

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The second quotation portrays the cynicism resulting from such strength:

> . . . a lay jury as well as lay witnesses are far more competent to determine "responsibility" than the experts. The experts are incapable of reaching a moral judgment which is responsive to the question the jury must answer; for they are strangers to the "folklore" of human behavior. If one does not believe in the existence of witches, he can hardly be of much utility as a witch-hunter.

Despite its viewpoint, the above calls a spade a spade. It becomes obvious that the modern inquisition, the discernment of moral responsibility in the accused, relies on the psychiatrist rather than the medieval torturer to extract information necessary to brand the accused as "normal" enough to be morally responsible. Only now it is the mentally ill who are exempt from being witches, a strange turn in history. Were a psychiatrist to write a book entitled "Determining Normality in Criminals," we would have in hand a modern *Malleus Maleficarum*. This is an ironic and pathetic situation for psychiatry to be in. We have had the alternative of abandoning the courtroom or of trying to work along as best we can, liberalizing the criteria regarding criminal responsibility by our cooperation. The latter seems the course of wisdom if we are not deluded into the view that science can ever establish criteria which have any rational connection with this metaphysical inquisition concerning moral responsibility. Liberalized criteria for establishing criminal responsibility, as represented by the Durham decision, for example, are but siren songs, luring the psychiatrist from his deterministic science to pose as an expert on theological matters. Where in the range of psychodynamics does moral responsibility suddenly or gradually appear? No scientist can answer that because moral responsibility is an idea belonging to a realm of discourse foreign to science. Asking the psychiatrist to ascertain the presence of moral responsibility in criminals is like asking the surgeon to dissect out the soul or the astronomer to locate heaven.

If the procedure of establishing criminal responsibility is to be other than a euphemistic disguise for the inquisition of moral responsibility, we must delineate what actual consequences result from determining criminal responsibility and understand why and if these consequences are necesary or desirable. By studying the procedure of establishing criminal responsibility like any other phenomenon in society we discover the operational meaning or "cash value" of the concept. For the sake of brevity I shall present this operational analysis of the concept of criminal responsibility in deductive fashion.

Criminal law is administered in accordance with several value judgments:

(1) Society is entitled to protection from further malfeasance by the criminal. A subsidiary value judgment is that a degree of punishment or isolation can be imposed on the criminal as a method of securing this protection.

(2) Society is entitled to protection from potential criminals, from first offenders as well as repeaters. A subsidiary value judgment is that apprehended criminals can be punished by society to create deterrent examples before the law as a warning to potential criminals.

(3) Society is best served by humane administration of the law consistent with the humane purpose of the law.

These value judgments can be condensed into 3 aims in administering criminal law: (1) preventing further malfeasance by the criminal; (2) deterring others from committing criminal acts; (3) humaneness toward criminals.

Other aims such as vengeance toward the criminal are rejected as unworthy of society, although they persist as contaminants in the judicial process. Administering criminal law involves striking a balance between the 3 general aims just mentioned, a very difficult procedure sometimes. Methods of achieving these aims are now briefly reviewed.

The aim of preventing further malfeasance by the criminal can be accomplished by isolating him from society through imprisonment, hospitalization, or execution. Another way of preventing a criminal from committing more crimes is to rehabilitate him into a good citizen, either through psychiatric treatment, in or out of hospitals, or by punishment, in or out of prison. Punishment as a method of rehabilitation is given in the same educative spirit as in punishing a child.

The second aim in administering criminal

law, deterring others from criminal acts, is accomplished by creating deterrent examples before the law by punishing criminals in hand as a warning to potential criminals.

The third aim, humaneness, is accomplished by inflecting no unnecessary punishment upon the criminal. "Necessary" punishment is that punishment sufficient either to rehabilitate the criminal by teaching him a lesson or sufficient to adequately deter most others from violating the law, or sufficient to accomplish both at once. The advantage of imprisonment is that it can provide punishment sufficient for both rehabilitation and determent while also isolating the criminal from society.

Whether or not criminals can be efficiently rehabilitated by punishment is a question of fact. The present assumption in law is that the fairly "normal" criminal is amenable to being taught a lesson by punishment. On the other hand, the law also recognizes that many psychotics and neurotics are so compulsively driven by psychopathology that no reasonable punishment will succeed in altering their behavior. Two factors are involved: the type of punishment and the psychodynamics of the punished.

Whether or not punished criminals make efficient deterrent examples before the law is also a question of fact. The answer hinges on the psychology of those to be deterred. The law currently operates on a rather simple rule of thumb which describes the psychology involved: Those most like ourselves usually makes the best deterrent examples for us. The most impressive way to learn the lesson that we will be punished if we commit a crime is to learn by the sad experience of being punished for a transgression—learning by experience. A more efficient but less impressive way is to learn by example. Examples most like ourselves come closest to learning by experience and are therefore the best examples. Whatever we may think of this theory of determent psychology, it is the implicit theory with which criminal law is now operating.

With the above in mind, the problem arises as to which criminals will be the best deterrent examples for warning those to be deterred. Another problem concerns the determination of which criminals can be efficiently rehabilitated by punishment. The shotgun technique of punishing all criminals strikes us as inhumane since exercising some selectivity permits us to avoid inflicting unnecessary punishment on inefficient deterrent examples and inefficiently punishable criminals. In other words, we want to balance the aim of humaneness to criminals with the aims of preventing further malfeasance by the criminal and by potential criminals.

Most psychotic and many neurotic criminals fail to appear enough like the average to make good deterrent examples before the law, Nor are they good deterrent examples for those most like themselves, other psychotics, since such persons are too lost within themselves to be amenable to any deterrent examples. Consequently we wish to exempt these inefficient deterrent examples from punishment for purposes of determent. Usually these same persons are also inefficiently punishable—*i.e.*, punishment will not rehabilitate them.

In regard to determent, it is interesting to note that it is merely the appearance of the criminal, how his overt behavior impresses the population to be deterred, which is of crucial importance. This complex problem is currently handled by relying on a rather random sampling of the general population, 12 jurors tried and true, to reflect the psychological response of the general population by deciding whether or not the criminal strikes them as "normal"—*i.e.*, (implicitly) enough like themselves to make a good deterrent example. It is only in connection with considering the probability that punishment may rehabilitate the criminal that all of the details of his psychodynamics become important.

It now becomes clear that when we try to distinguish between mentally ill and "normal" criminals or between those who know right from wrong, or by using other criteria for criminal responsibility, ostensibly to determine whether or not they are morally responsible, we are really trying to decide whether or not the criminal is sufficiently normal to be enough like the rest of us to serve as an efficient deterrent example before the law and whether or not he is normal enough to mend his ways if taught a lesson by punishment. The entire content of the concept of criminal

responsibility, as far as the natural world is concerned, is contained in the following definition: criminal responsibility is deterrent efficiency and/or efficient punishability. Deterrent efficiency is the degree of effectiveness of the criminal serving as a deterrent example before the law in deterring most others from crime. Efficient punishability is the susceptability of the criminal to being adequately rehabilitated, as regards asocial acts, by the method of reasonable punishment.

In many cases of "temporary insanity" and in crimes resulting from "adequate provocation," it is the circumstances leading up to the crime rather than the personality of the criminal that are too unusual to require making the person an example before the law. Also, the circumstances may be regarded as so provocative that the average person in this situation would be as impervious to determent as the psychotic. So determent seems unnecessary and impracticable. Regarding rehabilitation of the criminal, the circumstances of the crime may be so unusual that it is highly improbable that the criminal will ever be exposed to them again. Consequently it is pointless as well as ineffective to try to rehabilitate him to an extent that he would behave differently if he ever encounters this unusual situation again. The assumption is that he will not be a criminal in usual circumstances. So again, punishment for purposes of rehabilitation is too unnecessary and ineffective to be humanely administered to these "normal" personalities who have committed crimes because of very unusual circumstances.

The concepts of deterrent efficiency and efficient punishability are quantitative although not currently measurable. They deal only with matters of complex but ascertainable fact in the natural world. They are consistent with the determinism of causal or stochastic (probability—type) principle and have no reference to the metaphysical concept of moral responsibility. They are the key to the effective administration of criminal law and represent what we have implicitly been doing right for the wrong reasons during our long preoccupation with the illusory relation between mental illness and moral responsibility. They furnish a firm guide as to the kind of questions a psychiatrist can answer in the courtroom without departing from science into metaphysics. These questions are:

1. Is the accused capable of adequately participating in his defense?

2. Was the accused psychologically capable of or motivated toward committing the crime?

3. What are the probabilities of the criminal repeating crimes under the following conditions: (a) after punishment (*i.e.*, is he efficiently punishable); (b) after psychiatric treatment in a hospital; (c) after no punishment, treatment, or rehabilitation; (d) while living in society during attempts at rehabilitation?

4. What are the probabilities that the punished criminal will make an efficient deterent example before the law?—*i.e.*, what is his deterrent efficiency?

5. What are the probabilities of the criminal again getting into circumstances similar to those precipitating his criminal act? Were these circumstances essentially happenstance or did he seek them?

6. What lattitude of circumstance is sufficient to precipitate criminal behavior by this criminal?

7. What are the probabilities that the average person might find himself in circumstances similar to those of the crime?

8. What is the probability that the average person would respond to these circumstances with a criminal act?

It must be apparent that some of these questions require the consultation of the sociologist or criminologist as well as the psychiatrist. Questions 3 and 4 deal with criminal responsibility and 5 through 8 deal with "temporary insanity" and "adequate provocation."

Discussion

Criminal responsibility historically has been identified with moral responsibility. Moral responsibility is a metaphysical or theological term about which no science, including psychiatry, can say anything scientific. Establishing psychiatric criteria for determining the presence of moral responsibility in criminals is a logical impossibility. In this article criminal responsibility is di-

vorced from moral responsibility and is redefined as deterrent efficiency and/or efficient punishability, quantitative concepts dealing with the effectiveness of a punished criminal as a warning to others and the susceptibility of a criminal to rehabilitation through punishment. Regarding criminal responsibility, the psychiatrist can appropriately answer only questions bearing on these 2 complex problems of fact. These are the questions he is really answering when he gropes around in the scientifically meaningless search for moral responsibility in criminals. This article attempts to furnish the psychiatrist with adequate conceptual tools for a positive alternative to the law's antique preoccupation with the metaphysical concept of moral responsibility. This alternative is: Criminal responsibility is a concept concerning discriminations of fact in the natural world. These discriminations of fact are necessitated by our attempts to balance three aims in administering criminal law, prevention of further malfeasance by the criminal, deterrence of potential criminals from crime, and humaneness toward criminals. These 3 aims derive from value judgments regarding society's entitlement to humane protection. While these value judgments may have metaphysical origins, carrying them out requires scientific rather than metaphysical conceptions. Moral responsibility and judgment are misplaced metaphysical conceptions quite inappropriate to the administration of law in the natural world, an area that requires scientific rather than metaphysical conceptions. Moral values embodied in the laws must be applied in the natural world through concepts appropriate to that world. The revised conception of criminal responsibility meets this necessity.

Besides providing the ground for understanding the reasons behind previous criteria of criminal responsibility, the operational concept of criminal responsibility entails several changes in the judicial process. By disqualifying the state as a moral judge of individuals, the separation of church and state is confirmed. Abandoning the moral judgment of individuals removes another obstruction to the government of acts by law rather than of individuals by men. The redundancy inherent in compounding the moral judgment of acts embodied in the law with the moral judgment of individuals who violate the law is avoided. Finally, it permits us to recognize that determining criminal responsibility involves the problem of what to do with an individual who has violated the law rather than the establishment of his guilt. Determining criminal responsibility is currently a prelude to pronouncing a judgment regarding guilt only because of the confusion about moral responsibility. It is operationally a part of the sentencing procedure. This is why the psychiatrist should be an adviser to the court regarding sentencing rather than a controversial participant in establishing moral guilt.

Summary

If the operations stemming from a concept comprise its meaning, the meaning of criminal responsibility is defined as deterrent efficiency and/or efficient punishability, quantitative, operational concepts without the metaphysical connotations of moral responsibillity. As a consequence, the role of the psychiatrist in the courtroom is specifically revised.

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BRAIN CHANGES IN ELECTROSHOCK THERAPY

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INTRODUCTION

In 1938 Cerletti and Bini introduced a technique for the treatment of certain psychiatric illnesses which consisted of convulsive seizures induced by administering an electrical current to the head. Electroshock therapy, since that time, has become one of the most widely used organic therapies in psychiatry. It is considered to be a very safe procedure with a mortality rate of under .1% (27, 28). However, fatalities do occur, and since the routine use of electroshock usually results in alterations of cerebral function, continuous postmortem search has been made for changes which might be caused in the cerebrum.

A number of investigators have given electrical shocks to animals and then examined the brains for pathological changes. Others have studied the brains of patients who died following use of this therapy. The lack of agreement in the reports indicates a need for further investigation. It is the purpose of this paper, therefore, to describe the findings in the brains of 4 patients who died following electroshock treatment, in an effort to determine whether or not there is any correlation between the changes found and the therapy.

REVIEW OF THE LITERATURE

Experimental Studies.—Several comprehensive reviews of the brain changes in animals following electroshock have been written. Alpers(1) in 1946 summarized the findings thus:

> There appears to be some evidence from experiments in rats, rabbits, cats, and dogs that there is brain damage. . . . Hemorrhages have been found in the meninges, especially over the brain stem, in the cerebrum, and in the cerebellum, associated with relatively little glial reaction, but showing indications of organization. Opposed to these findings are several studies which cast considerable doubt on the validity of the observations recorded.

More recently, in an extensive survey of the experimental work, Hartelius(2) divided the reported findings into vascular changes, glial changes, nerve cell changes, and irreversible changes in the form of disappearance of nerve cells and areas of devastation. The vascular changes included subarachnoid hemorrhages, intracerebral petechial hemorrhages, vascular dilatation, and cerebral edema. The glial alterations were chiefly reactive to the hemorrhages. Nerve cell changes included pyknosis and tigrolysis. Hartelius mentions, in addition, numerous studies in which these changes were not found. He lists 15 possible reasons for the variations in the reports, including such things as differences in animal species, ages of animals, strength of current used, method for sacrificing the animals, etc. In his own rigidly controlled experiments on 57 cats, Hartelius found characteristic, sac-like dilatations of the perivascular spaces, which in some cases contained histiocytic elements; the glial reaction was of the progressive type, consisting of an increase in the number of the smaller glial elements in the parenchyma and of satellitosis beside the nerve cells; and the nerve cells changes included various stages of chromophobia, frequently with coincident nuclear hyperchromatism.

Pathological Reports on Humans.—The human material is equally varied. Table 1 summarizes the brain changes reported in the literature to date. The ages of the patients ranged from 20 years to 79 years. The number of shocks given varied from 1 to 46; but 17, or almost half of the cases, died after 3 treatments or less. The interval between the last treatment and death extended from "immediately" to 5 months, 22 of the 38 having died within a day of the final shock. The general pathological findings revealed cardiovascular disease in 14 cases. Kidney disease including glomerular nephritis, lower nephron nephrosis, and renal changes resembling those found in the crush syndrome, were found in 5 cases. One patient had a massive thyroid hemorrhage, and 1 man committed suicide 24 days after his treatment by jumping out a window.

By far the most frequent alterations re-

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TABLE 1

SUMMARY OF PATHOLOGICAL REPORTS ON HUMAN BEINGS

Authors	Age	No. of shocks	Time interval between shock and death	General pathological findings	Neuropathological findings			
					Vascular	Neuronal	Glial	Other
1. Alpers and Hughes (4)	45	46	2 months	Cardiac failure, bronchopneumonia	Punctate hemorrhages in cerebral cortex, medulla, cerebellum and basal ganglia	—	—	—
2. Alpers and Hughes (4)	79	6	5 months	Cardiac failure	Cerebral arteriosclerosis, scattered areas of recent and old perivascular hemorrhage	—	Gliosis and fibrosis	—
3. Levy (5)	—	—	—	Heart failure	Many dilated capillaries with hemorrhages which antedated the acute myocardial failure	—	—	—
4. H. Solomon (6)	20	19	15 hours	Pulmonary edema, glomerular nephritis	—	Grossly normal		—
5. Ebaugh *et al.* (7)	57	13	1 hour, 35 minutes	Coronary occlusion, myocardial infarction	—	Small areas of cortical devastation, diffuse degeneration of nerve cells	Astrocytic proliferation	—
6. Ebaugh *et al.* (7)	57	3	Immediate	Respiratory failure	—	Small areas of recent necrosis in cortex, hippocampus and medulla	Astrocytic proliferation	—
7. Cash and Hockstra (8)	47	5	2 hours, 10 minutes	Sclerosis of coronary arteries	—	No Changes		—
8. Gralnick (9)	35	2	2 days	Hypoplasia of circulatory system	Edema, occasional punctate hemorrhages, cerebrovascular syphilis	—	—	—

9. Jetter (10)	61	8	12 minutes	Coronary arteriosclerosis with coronary occlusion and myocardial infarction	Moderate cerebral arteriosclerosis	—	—	—	
10. Jetter (10)	70	6	12 minutes	Coronary arteriosclerosis, old myocardial infarction	Cerebral arteriosclerosis, old healed infarcts of right lenticular nucleus, recent small cortical infarcts	—	—	—	
11. Napier (11)	46	1	6 hours	Extensive thyroid hemorrhage	—	Brain and spinal cord normal		—	
12. Napier (11)	62	2	40 minutes	Myocardial degeneration	—	Cortical atrophy		—	
13. Meyer and Teare (12)	53	1	12 hours	—	Fat emboli in all regions of brain, including cerebellum				
14. Gralnick (13)	60	2	3 days	—	Mild arteriosclerosis, recent scattered hemorrhages, vascular changes secondary to increased intracranial pressure	—	—	Large meningeal fibroblastoma in frontal fossa	
15. Will *et al.* (3)	48	1	15 to 20 minutes	Arterial hypoplasia, chronic myocarditis	Arterial hypoplasia, acute cerebral edema	Central chromatolysis, pyknosis, shadow cells	—	Foraminal herniation	
16. Liban *et al.* (14)	47	7	7 days	—	Extensive subdural and subarachnoid hemorrhage, thromboses of longitudinal and transverse sinuses, hemorrhagic softening of cerebral cortex, thalami, and cerebellum, petechial hemorrhages throughout	Shrinking and swelling, ghost cells	Satellitosis and neuronophagia	—	

TABLE 1—*Continued*

Authors	Age	No. of shocks	Time interval between shock and death	General pathological findings	Neuropathological findings			
					Vascular	Neuronal	Glial	Other
17. Goodman(15)	31	3 Courses	15 days	Lower nephron nephrosis	Edema, mild hyperplastic changes and hyperchromatic endothelial swelling	Chromatolysis, cell shrinkage	Diffuse gliosis, glial nodules beneath the ependyma of third ventricle	—
18. Goodman(15)	40	1	13 days	Lower nephron nephrosis	Subarachnoid hemorrhage over right frontal pole	—	Increased astrocytes	—
19. Cucchi(16)	60	3	40 minutes	Coronary atherosclerosis	Cerebral arteriosclerosis, extensive subarachnoid hemorrhage, petechial hemorrhages in basal ganglia	—	—	—
20. Martin(17)	47	6	9 days	Pulmonary infarction	Multiple capillary cerebellar hemorrhages	—	—	—
21. Martin(17)	28	4	15 days	Chronic pyloric stenosis	Multiple capillary hemorrhages in floor of third ventricle, medulla and around aqueduct of sylvius	—	—	—
22. Martin(17)	52	11	12 days	Myocardial infarction	Severe atherosclerosis	—	—	Generalized atrophy
23. Martin(17)	35	8	24 days	Fractured lumbar vertebrae by jumping out of window to death	Capillary cerebral hemorrhages	—	—	—
24. Riese(18)	30	2	48 hours	Subacute cystitis, acute pyelonephritis	Generalized increase in vascularization and edema, occasional petechial hemorrhages in medulla	Ischemic and pyknotic ganglion cells	—	—

25. Riese (18)	55	2	10 minutes	Adipose infiltration of myocardium, pulmonary arteriolar sclerosis	Moderate arteriosclerosis, numerous pericapillary hemorrhages in the meninges and brain	Pigmentation and fatty degeneration, sclerotic and ghost cells	Perivascular and pericellular gliosis	Numerous slits and rents similar to electrocution
26. Medlicott (19)	54	Course	Few weeks	Hypertensive, retinal vascular changes	Cerebral hemorrhage	—	—	—
27. Clute (20)	59	1	7 days	Anuria, renal changes resembling crush syndrome	Minimal atheromata of cerebral arteries	—	—	—
28. Sprague and Taylor (21)	48	6	12 days	—	Areas of hemorrhage and infarction in left temporal lobe, hippocampus and gyrus cinguli	—	—	—
29. Gayle and Neale (22)	—	—	—	Fatty degeneration of heart	—	—	—	Cystic enlargement of fifth ventricle
30. Maclay (23)	58	3	20 minutes	—	Fat embolism in small vessels of brain	—	—	—
31. Maclay (23)	48	2	2 hours	—	Large hemorrhage in internal capsule	—	—	—
32. Maclay (23)	57	1	50 minutes	—	Punctate hemorrhages in cerebral peduncle, pons and medulla	—	—	—
33. Maclay (23)	28	2	Immediate	Subacute bacterial endocarditis	Recent softening in right basal ganglia, insula and adjacent regions of temporal and parietal lobe	—	—	—
34. Maclay (23)	52	2	Just before third treatment	Large thyroid adenoma, tuberculosis of spine	Pinpoint hemorrhages on anterior wall of fourth ventricle and in the substance of the medulla	—	—	—

TABLE 1—*Continued*

Authors	Age	No. of shocks	Time interval between shock and death	General pathological findings	Neuropathological findings			
					Vascular	Neuronal	Glial	Other
35. M. Moore (24)	44	3	1 day	—	Congestion of pial veins in frontal and parietal lobes, small localized subarachnoid hemorrhage over tips of both frontal lobes, petechial hemorrhages in frontal cortex	—	—	—
36. Larsen and Vraa-Jensen (25)	45	4	36 hours	Bilateral bronchopneumonia, pulmonary edema	Edema and hyperemia, small fresh hemorrhages in leptomeninges and in superficial cortical layer in the area on a level with the place of the electrode	Decrease in ganglion cells in frontal lobes, lipoid pigment in globus pallidus and medial nucleus of thalamus	Moderate glial proliferation	—
37. Corsellis and Meyer (26)	27	6 (140 in 5 years)	Immediate	Curare-respiratory death	Congestion small cerebral blood vessels	—	Glial fibrosis in marginal layer of cortex, gliosis around ventricles and in marginal areas of brain stem, perivascular gliosis in white matter	—
38. Corsellis and Myer (26)	40	45	Immediate	Right ventricular heart failure	Small hemorrhages over frontal and occipital lobes, occasional perivascular hemorrhages	—	Marginal proliferation of astrocytes, glial fibrosis around blood vessels of white matter, gliosis of thalamus, brain stem and medulla	—

corded in the brain were in the vascular system. Petechial hemorrhages were found in 17 of the 38 cases; subarachnoid hemorrhages in 4; and large intracerebral hemorrhages in 2 cases. Areas of softening were described in 3 patients, one of whom had subacute bacterial endocarditis and may have had emboli to the brain. There were 2 cases with fat emboli.

Ganglion cell changes were not common and were nonspecific. Three cases were found to have a decrease in ganglion cell population, one of these being localized to the frontal lobes. Five reports described cell shrinkage and pyknosis. Thirty patients (80%) had no significant neuronal changes.

Alterations in the glial cells were also infrequently described. In 9 cases an increase in neuroglia, chiefly astrocytes, was observed. Two of these had perivascular gliosis, 2 had periventricular and subependymal glial proliferation, and the rest were diffusely scattered. In 74% of the total group no neuroglial changes were noted.

Of the deaths recorded, 16 or 40% were considered as probably due to, or markedly influenced by, cerebral complications. These included 4 with extensive petechial hemorrhages, especially in the brain stem; 3 cases with cerebral emboli; 3 with encephalomalacia; 2 with large intracerebral hemorrhages; 1 with extensive subdural and subarachnoid hemorrhages; 1 with massive subarachnoid hemorrhage; 1 with a foraminal herniation; and 1 with a meningioma over the frontal lobe. Riese(18) described numerous slits and rents in the brain similar to those reported in electrocution.

Eight of the 38 cases or 21% revealed no significant pathological changes in the central nervous system other than cerebral arteriosclerosis and a cyst of the fifth ventricle.

In the 4 patients reported here, all showed definite neuropathological alterations.

CASE 1.—J. D.—#49-139—A white male, aged 34, single, was admitted to the hospital on February 1, 1949, with a diagnosis of catatonic schizophrenia. He was known to have had rheumatic fever at the age of 10 years, which left a residual mitral stenosis. In June 1948 he had cardiac decompensation, which was controlled with digitalis. At the time of his admission he was receiving a maintenance dose of digitalis, 1½ grains (0.097 gm.) daily. The activity in his psychosis produced obvious signs of decompensation, and it was necessary to increase the dose of digitalis to 1½ grains t.i.d.

The patient's physical condition would not ordinarily have been considered suitable for electroshock therapy. However, his inability to cooperate with the routine for patients with cardiac disease made it necessary to consider electroshock for its sedative effect. Members of the family were willing to permit electroshock despite the patient's grave physical condition.

On March 14 he received his first treatment, 3 cc. of curare being given intravenously for 3 minutes up to 90 seconds before treatment, with no untoward reaction. A major convulsion was produced with the machine set at 70 volts for 0.4 second. Immediately after the convulsion, neostigmine methylsulfate was given intravenously and oxygen by mask. The patient was abnormally cyanotic for 20 minutes after treatment. With a similar technic, treatment was repeated every other day for 4 more treatments, with notable improvement in the mental status. After each treatment, cyanosis persisted for 5-10 minutes.

Twelve days after therapy was begun, the patient was given his sixth treatment. After the injection of curare he became more cyanotic than usual, and respirations were embarrassed. He became rigid as soon as the current was applied and did not have the typical grand mal convulsions. His pulse and respiration were never resumed after application of the current, and prolonged attempts to revive him were unsuccessful.

Necropsy was not performed until 9½ hours after death. The general pathologic report was as follows: "Myocardial infarct involving the septum and right ventricle at the apex was observed. On gross and microscopic evidence this was thought to be approximately 2 weeks old." Death was the result of cardiac arrest.

Gross examination of the brain revealed no abnormalities. On coronal section there was congestion of the blood vessels in the floor of the 4th ventricle.

Microscopic Description.—Celloidin sections were made from several portions of the cerebral cortex, the basal ganglia, the brain stem and cerebellum. In the sections through the cerebral cortex, there was fibroblastic thickening of the meninges. The meningeal blood vessels showed intimal proliferation, some having quite thickened walls with narrowed lumens. In the gray matter there were several small scattered fresh ring hemorrhages. The ganglion cells were decreased in number, and many areas were devoid of ganglion cells. Many of those remaining were dark staining and pyknotic with a marked increase in neuronophagia and satellitosis. Others had eccentrically placed nuclei, many being partially extruded. There were shadow cells scattered throughout. Many of the ganglion cells had small vacuoles in the cytoplasm. The cortical arterioles were thickened and small doughnut-shaped blood vessels were seen. An occasional blood vessel had a slight perivascular cuff, composed of lymphocytes and plasma cells.

In the basal ganglia there were fresh ring hem-

orrhages scattered throughout the tissue, several seen prominently in and around the caudate nucleus. In this nucleus the ganglion cells were decreased in number, particularly the magnocellular types, and most of those remaining were shrunken and dark staining with a marked increase in neuronophagia. Shadow cells were present. Vacuoles of varying sizes were seen in the cytoplasm of many of the ganglion cells. There was thickening of the arterioles and occasional perivascular lymphocytes were seen. In the white matter were small areas of rarefaction immediately surrounding the blood vessels.

A section through the dentate nucleus of the cerebellum and medulla revealed small fresh ring hemorrhages in the floor of the 4th ventricle. The blood vessels were markedly engorged and dilated. There were many small calcified plaques in the choroid plexus of the 4th ventricle. The ganglion cells of the hypoglossal nucleus were fairly well preserved but were pale staining in the region of the hemorrhages. In the cerebellum there was some decrease in the number of Purkinje cells and many of those remaining had lost much of their Nissl substance. Scattered throughout the sections studied were small corpora amylacea.

CASE 2.—M. B.—#50-69—A 62-year-old white woman who had recurrent episodes of manic-depressive psychosis, manic type, had been hospitalized 7 times previously, beginning in 1916. On all of these admissions she had responded very promptly to electroshock. On the last admission, she was in her usual manic state and was started on electroshock December 16, 1949. On the 35th day after therapy began, she received her 20th treatment. Her reaction was not different from that to any of the other treatments except that upon recovering from the shock she complained of headache. Two hours later she vomited and within the next hour developed a left-sided hemiplegia. In 4 hours she lapsed into coma with complete flaccid paralysis and diminished tendon reflexes throughout. She failed to respond to any supportive measures and died 16 hours following her treatment. General autopsy showed no significant pathological changes.

Gross examination of the brain and dura revealed the dura to be smooth and translucent. The superior longitudinal sinus was patent. Over both frontal lobes there was some clouding of the meninges, which extended back to the postcentral gyrus bilaterally. There was blood in the subarachnoid space at the base of the brain, and occasional scattered atheromatous plaques in the basilar blood vessels, particularly in the basilar artery and the posterior communicating arteries. At the foot of the precentral gyrus there was a focal collection of subarachnoid blood. The cerebellum was flattened and the hippocampal gyri were prominent, with notching of the unci.

Coronal sections of the cerebrum and cross sections of the brain stem and cerebellum revealed a massive intraventricular hemorrhage, extending into all 4 ventricles, including the aqueduct of Sylvius. In the region of the head of the caudate nucleus there was a large firm blood clot which began at the medial edge of the internal capsule and extended through the head of the caudate nucleus into the lateral ventricle. There was staining of the cerebral tissue surrounding all the ventricles, particularly at the head of the caudate nucleus. In the section through the region of the red nucleus, there was a small subependymal hemorrhage in the right thalamus. In 1 area this hemorrhage had extended down to and included most of the dorsomedial nucleus of the thalamus.

Microscopic Description.—Celloidin sections of the brain and brain stem, stained with hematoxylin and eosin, Weigert, and toluidine blue, revealed an organized but fresh blood clot in the entire ventricular system, including the fourth ventricle but not extending through the foramina of Magendie and Luschka. The blood clot lay loose in the ventricles, and only infrequently was the ependymal lining destroyed.

At the level of the third ventricle there was a hemorrhage in the substance of the brain which extended through the superior portion of the thalamus and included part of the body of the caudate. Most of the red cells were hemolyzed but this hemorrhage was not associated with gitter cells or glial reaction. There was no hemorrhage in the substance of the pons.

Throughout the cortex there was a moderate decrease in the neuronal population. The ganglion cells showed slight swelling, some dissolution of the Nissl substance, and occasionally some pyknosis. Infrequently there was vacuolization of the cytoplasm of the ganglion cells. There were no petechial hemorrhages in the gray or white matter. The pial and cerebral blood vessels showed slight arteriosclerotic changes. The cerebellum was normal.

In the brain stem the nerve cells were swollen, the nuclei were frequently eccentric, the Nissl substance was clumped, and some cells were almost completely degenerated. The changes in these cells were more pronounced than in the cortical cells.

CASE 3.—J. C. F.—#50-19—A 68-year-old man was admitted to the hospital on February 17, 1949, because of depression, auditory hallucinations, severe and constant preoccupation with elimination, pruritis ani, and ideas of reference. His wife stated that in 1945 or 1946 he had had a previous "stroke," details of sidedness not being available, but the symptoms cleared in about 14 hours. The patient stated he had had a blood clot in the right leg 3 or 4 years before. There was also the history of a coronary thrombosis 5 years previously.

Physical examinations showed auricular fibrillation, a scar from radiation (therapeutic for an alleged breast tumor) over right breast, with a small nodule which oncologists failed to diagnose as malignant. All laboratory studies except for the electrocardiogram were negative. His mental status cleared markedly and he was discharged.

Three months later he was readmitted and a course of electroshock was begun, but in the first treatment 3 abortive shocks were given with convulsion.

Two days later, ½ hour after the second treat-

ment (again 3 abortive shocks) the patient developed a paralysis of the right arm and leg and motor aphasia. Stellate ganglion block produced a good Horner's syndrome but failed to alter his condition. Examination of the cardiovascular system revealed auricular fibrillation with no acute decompensation.

Two days after the last treatment a lumbar puncture was performed. The spinal fluid protein was 76 mgm. His temperature rose to 102° because of cystitis which developed, and penicillin was administered.

Twenty-four days later a progress note indicated that there was some slight return of function in the right arm. Pain developed in his right leg around a decubitus ulcer in the region of the external malleolus, and a popliteal embolus was suspected. Dicumerol and sympathetic nerve blocks were administered. Five days later there was gangrene of the right small toe and dorsum of foot, and the right leg was amputated. On July 1, 1949, 36 days after the last treatment, he died.

General autopsy revealed generalized arteriosclerosis, a mural thrombus in the left auricle, embolic infarcts of the kidney, and thrombosed pulmonary veins.

The brain had been cut in 14 coronal sections. The leptomeninges over the dorsolateral surface appeared to be slightly thickened and cloudy. At the junction of the caudate nucleus and putamen in the left hemisphere, there was a cystic area 2 cm. in diameter, extending inward from the left Island of Reil into the anterior horn of the left lateral ventricle. The cyst was seen posteriorly as far as the pulvinar. This cystic area also extended inferiorly involving the left globus pallidus. Cross sections of the brain stem and cerebellum were normal.

Microscopic Description.—Celloidin sections of the cortex, the basal ganglia, cerebellum and brain stem were studied. The cortex revealed moderate arachnoidal thickening. There was intimal proliferation of the pial blood vessels. In the gray matter there was marked ganglion cell loss with an increase in glial cells, chiefly astrocytes. In one portion of the section taken through the frontal lobe, there was a small circumscribed area of softening in which the normal architecture was destroyed and replaced by gitter cells and swollen astrocytes. In the section through the temporal lobe, there was meningeal thickening with some red cell infiltration in the subarachnoid space. In both the gray and white matter, were small fresh perivascular hemorrhages. Similar small fresh perivascular hemorrhages were seen in the parietal and occipital lobes, the thalamus, and the caudate nucleus.

Several sections through the internal capsule revealed an extensive area in which the normal architecture was completely destroyed and replaced by gitter cells. The blood vessels surrounding this lesion had a perivascular cuff of mononuclear cells. In one portion of the cyst there was a large vein with a necrotic wall, and this was surrounded by hemorrhage. Sections through the cerebellum revealed 2 areas of softening in which the normal tissue was completely destroyed and replaced by gitter cells. In the mesencephalon perivascular hemorrhages were also seen in the periaqueductal gray; and in the sections through the medulla there were small fresh perivascular hemorrhages in the floor of the 4th ventricle in the region of the hypoglossal nucleus. The neurones of the hypoglossal nucleus were pyknotic.

Case 4.—R. D.—#49-198—A married white man, aged 54, was admitted to the hospital on May 17, 1949, with an agitated depression of 2 years' duration, for which there had been no previous psychiatric treatment. There was no evidence of a toxic or organic factor except for the electrocardiographic report of a borderline normal record. Electroshock was started on the day following his admission. Treatment was of the multiple stimulus type. After the intravenous injection of 2 cc. of curare, the machine was set at 70 volts for 0.4 second and a stimulus administered. Immediately after the initial convulsion, the stimulus was repeated. This was done 4 times. The first 4 treatments were given on consecutive days, and considerable improvement was noted psychiatrically. There was no unusual physical reaction after the treatments. Five days after therapy was started, the fifth treatment was given, following which the patient seemed to make a normal recovery, and 40 minutes later walked unassisted to his room on another floor of the hospital. Breakfast was brought to him, and as he stood up to receive the meal he collapsed on his bed. He became dyspneic and cyanotic and the pulse and blood pressure were unobtainable. Death occurred 45 minutes after the last electroshock treatment. The clinical diagnosis was myocardial infarction.

Necropsy, performed 5 hours after death, revealed arteriosclerotic heart disease with sclerosis of the coronary blood vessels. There was complete occlusion of both coronary arteries in their proximal portions, and advanced myocardial fibrosis. The coronary arteries were patent in their middle and distal portions. This condition was interpreted by the pathologist as "evidence of collateral circulation by anastomosis with branches from the aorta, such as occurs in gradual occlusion of the arteries. Death was the result of myocardial failure."

The brain was normal grossly except for some mild diffuse subarachnoid blood and engorgement of the pial blood vessels. Celloidin sections of the cerebral cortex, basal ganglia, cerebellum, and brain stem were studied microscopically. In the cerebral cortex there was thickening of the leptomeninges with a small amount of fresh blood in the subarachnoid space. There was intimal proliferation of the meningeal blood vessels and most of these were dilated and engorged. Within the cerebral cortex several small fresh ring hemorrhages in the gray matter were seen, most of these being quite small and many still had intact blood vessels in the center. There was some thickening of the arterioles. The ganglion cells were pale staining, most had lost their Nissl substance, many had an indistinct nuclear membrane with the nucleus eccentrically

placed in some, and an occasional shadow cell was seen. Many had small vacuoles in the cytoplasm. There were several similar small hemorrhages in the caudate nucleus and putamen. In the region of the aqueduct of Sylvius somewhat larger hemorrhages were seen. These were also quite fresh and fragments of the blood vessel wall could still be found. There were 2 fairly large hemorrhages in the periaqueductal gray matter, and the ganglion cells here showed the same changes as those in the cerebral cortex. Two fresh hemorrhages were seen in the floor of the 4th ventricle.

Discussion

Study of the brains of 4 patients who died following electroshock treatment revealed significant vascular changes in all, ranging from petechial hemorrhages scattered throughout the tissue to a massive intraventricular hemorrhage (case 2). Three of the 4 cases had heart disease and probably died of cardiac failure. The patient with the extensive hemorrhage had a negative general autopsy and must therefore be considered as a cerebral death.

Two of the 4 patients developed hemiplegias after treatment. The woman who died 16 hours after her twentieth treatment (case 2) developed a left-sided hemiplegia. A hemorrhage was present in the right internal capsule, thalamus, and caudate nucleus as well as the entire ventricular system. Case 3 had had a hemiplegia which lasted less than a day 4 years before his death. After his second treatment he developed a persistent right hemiplegia but did not die until 36 days later, after he had developed gangrene of the right foot and acute cystitis. The brain showed an old cyst of softening surrounded by extensive recent encephalomalacia. Paralyses after electroshock have been reported, some persisting and others being only transient (24, 25, 26).

One of the most interesting findings in this study was the presence of small fresh hemorrhages in the periaqueductal gray matter and brainstem in 3 of the 4 cases. Eight of the 34 previously described fatalities had petechial hemorrhages in the brainstem. Martin (17) who reported 4 cases concluded that the treatment causes petechial hemorrhages "at least in some cases." Alexander and Lowenbach (27) feel that vascular alterations occurred in the path of the electrical current and that in those animal experiments in which brainstem hemorrhages occurred these were due to the low placement of electrodes. This would not seem to be an adequate explanation in the case of human beings, where the electrodes are usually placed over the lateral aspects of the cerebral hemispheres. Another possible explanation is that the treatment causes an acute cerebral edema which leads to back pressure on the small blood vessels, particularly in the brain stem, resulting in perivascular hemorrhages. This phenomenon has been observed in postoperative craniotomies where the acute cerebral edema following surgical manipulation may lead to a fatal outcome, the brain frequently showing hemorrhages in the periaqueductal gray matter, pons, and medulla.

In the patient with the massive intracerebral hemorrhage, the blood vessels of the Circle of Willis and their branches showed arteriosclerotic changes. Whether the hemorrhage was due to the treatment or was a coincidental occurrence is difficult to say; although the temporal relationship cannot be entirely ignored. Maclay (23) who reported 2 cases of intracerebral hemorrhage states: "One case may be a coincidence but two make it much less likely." It would be difficult to support the thesis, however, that cerebral arteriosclerosis is a contraindication to elechroshock, as the 2 patients of Maclay (only 1 of whom had an extensive lesion), the case of Medlicott (19) who had hypertension, and the present case are the only reports of massive intracerebral hemorrhage recorded.

The ganglion cell changes, so far as they could be studied by present staining techniques, showed chronic anoxic alterations which might be due to systemic circulatory impairment. Efforts to evaluate the neuronal changes by other laboratory studies are being made (2). The glial reactions were not specific but were chiefly secondary to the vascular changes.

The fact that neuropathological changes occur in fatalities following electroshock does not necessarily indicate that similar findings occur in all patients treated by this means. Animal studies suggest that reversible changes do occur. The findings of Hartelius (2), in experiments attempting to duplicate therapeutic electroshock in healthy cats, re-

vealed statistically significant alterations, so that slides of the brains of treated and untreated animals could be differentiated when examined as unknown specimens. Nevertheless, he states that "the incomparably greater proportion of changes in the vessel wall, the glia and the nerve cells may be regarded as reversible." Similar minor changes may well occur in healthy individuals treated with electroshock.

Where there are predisposing factors such as cardiac, renal, or vascular disease, however, more pronounced alterations may be produced. Whether these will lead to serious complications or a fatality is still very difficult to predict. The majority of such patients apparently withstand the treatment well and are left with no residual effects. On the other hand, when fatalities do occur it is frequently found that there is myocardial or coronary artery disease, or generalized as well as cerebral arteriosclerosis, or kidney disease. These patients show chiefly vascular changes in the brain, including hemorrhages and thromboses.

Summary

1. The brains of 4 patients who died following electroshock treatment were studied.

2. A massive intraventricular hemorrhage was found in one. The other 3 had petechial hemorrhages, particularly in the periaqueductal gray matter and brainstem.

3. Only 1 case could be considered a cerebral death, the other 3 dying of cardiac failure.

4. The literature on animal experiments and reports on human beings are reviewed and discussed.

5. If the individual being treated is well physically, most of the neuropathological changes are reversible. If, on the other hand, the patient has cardiac, vascular, or renal disease, the cerebral changes, chiefly vascular, may be permanent.

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ELECTROCARDIOGRAPHIC INDICES OF EMOTIONAL STRESS

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Because the heart is such a sensitive indicator of the physiological state the overt aspects of which are denoted by the terms stress, anxiety, etc., it is reasonable to assume that concomitant electrocardiographic indices may exist. And, indeed, many investigators have acted on this assumption. This paper attempts to review some of these studies and to derive whatever generalizations seem indicated.

It may be useful, before considering the studies themselves, to review some of the physiological conditions that influence the ECG. The most important of these for the present purpose are the respective influences of the sympathetic and parasympathetic nervous systems. There seems to be agreement (11, 16, 21) that the formation of an excitatory state, force of contraction, conductivity, and excitability tend to be enhanced by the sympathetic and depressed by the parasympathetic.

Increases in sympathetic tone beget, usually, greater P wave amplitude and shortened P and PR duration(11, 16). These changes probably result from an increase in conduction velocity. The effects on ventricular repolarization, as reflected by the T wave, are less clearly defined. The evidence now available indicates that increases in sympathetic tone lead to depression or inversion of T and depression of the ST segment, phenomena ascribed to an increase of coronary metabolism without a corresponding increase in the coronary circulation(16). Such a condition mimics that of coronary insufficiency. Epinephrine and other drugs which produce functional sympathetic dominance yield similar ECG changes(9, 36).

Vagal stimulation, either direct or reflex, results in low P waves, especially in leads II and III, and in a prolongation of PR. T amplitude usually increases. Individuals suffering from hypervagotonia, as in various types of ulcer, show this kind of ECG pattern(6). Acetylcholine produces prolongation of PR and depression of P, but its effects on T, because of reflex sympathetic stimulation, are more ambiguous.

A rather complete listing of the numerous non-disease factors which can produce ECG's resembling those found in primary heart disease is given by Sensenbach(32).

EXPERIMENTAL STUDIES

One of the early attempts to use the ECG as a measure of emotion was made by Blatz (2), who tilted subjects backward suddenly while they were seated in a chair and measured subsequent physiological changes. Blatz reported that the R wave increased in amplitude, not decreasing until several minutes later. The usual expectation in such a situation is a decrease, since sympathetic stimulation, by increasing intraventricular conduction velocity, terminates earlier the ascent of R. Landis and Slight(15) also attempted to study the relationship between surprise and changes in the ECG, using normals and psychotics. They found changes in all 10 normal subjects but none in the 5 cases of melancholia and in just 2 of the 7 cases of schizophrenia studied. The main changes seemed to consist of a tendency for the TP interval to decrease, but the tendency was far from overwhelming or universal. How significant such a result is from the standpoint of ECG pattern is uncertain, for Gross (8) has shown that this interval displays the greatest relative dependence on cardiac rate. Springer(33) was skeptical of the Landis and Slight results and repeated the study. He found, using 15 subjects (lead II), that startle stimuli produced shortening of TP. Springer suspected that the ECG changes were artifacts, and in a second experiment recorded arm muscle and heart activity simultaneously. His record showed that ECG irregularities were highly correlated with muscular activity and he concluded that the ECG changes observed in his and the Landis and Slight experiment were probably artifacts induced by extracardiac activity. This conclusion seems unwarranted for 2 reasons.

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First, muscle activity artifacts usually appear as irregular oscillations with a frequency of 10-300 c.p.s., and are superimposed on the ECG curve(16). Second, as shown by Cannon and Britton(5), minor bodily movements produce increases in the rate of the denervated heart of the cat, confirming the hypothesis that muscular activity produces increased adrenin output, which also results in ECG changes.

Another experiment that tested, like Landis and Slight, for differences between normals and psychotics was performed by Kivisto(13). Using 20 normals and 20 paranoid schizophrenics, with 10 men and 10 women in each group, the following stimuli were presented: a 30-second rest period, "pleasant" words, "indifferent" words, and a sudden loud sound. Significant differences were found in ST duration (lead I) between the normals and psychotics in response to pleasant words, with the psychotics showing longer segments. This is in agreement with Whitehorn's findings(41) that psychotics display slower heart rates, since ST duration is inversely related to heart rate. Differences in ST length were also noted between men and women in response to the startle stimulus. Garsche(7) studied the effects of a current of air in the face on the ECG of children. Shortening of the PQ segment, flattening of the P wave, and an increase in the T wave were observed, indicating both adrenergic and cholinergic influence.

Some investigators have been interested in the production of ECG changes in hypnosis. Bennett and Scott(1) reported that T wave elevations could be produced in 1 subject of the 5 they used. Jenness and Wible(12) found no changes. Polzien(30) reported that inversion of QRS and T occurred under suggestion of a conflict. The evidence, however, is scanty, and attempts to induce ECG alterations in hypnosis have not been notably successful.

CASE STUDIES

Many physicians have reported that ECG changes occur in patients who seem anxious or tense. Mainzer and Krause(23) found changes prior to an operation consisting of T reversal, fall of ST below the isoelectric line, and diminution in the amplitude of the QRS complex. They also found another group of symptoms consisting of increased P and T amplitudes and peaking. Magendantz and Shortsleeve (22) find that some patients taking ECG's show ST segment deviation and low or diphasic T waves. These alterations disappear when the patient is given reassurance. Loftus, Gold, and Diethelm (19) report similar phenomena. Ljung(17) claims that patients who display "autonomic imbalance" give ECG patterns with abnormal T waves and ST segments and that these deviations from normal are not due to hyperventilation(18). Wendkos(39) makes a similar claim. Thompson(37), however, finds that patients with anxiety neurosis and the hyperventilation syndrome often exhibit inversion of T or ST depression with diminished T. Whether the changes are due to alkalosis or to shifts in the position of the diaphragm is not certain, but they disappear with the removal of the hyperventilation symptom. An acutely anxious patient who showed depression of ST and inversion of T was studied by Mitchell and Shapiro(25). These ECG abnormalities, they report, could also be induced by the injection of adrenalin. Bruenn(4) found that several patients with impairment of A-V conduction time showed a distinct reduction in PR duration during what was interpreted as emotional stress.

Patients with cardiovascular complaints were interviewed by Stevenson and Duncan (34) and showed diminished T wave amplitude, increased P wave amplitude, and some ST segment changes during the interview, which, presumably, resulted from the anxiety associated with the discussion of personal problems. In interviews with patients free from cardiovascular disease, Stevenson, Duncan, and Ripley(35) also found increased P waves, diminished T waves, and depression of the ST segment below the isoelectric line. Flat or inverted T in leads V_2 and V_8 and diminished amplitude of the QRS complex were found by Walowski(38) during a precontest examination of ski-jumpers.

Kjaestad(14) studied an individual subject to recurrent attacks of catatonia. Over 8 months, during which 5 catatonic periods were observed, he found that T waves tended to be isoelectric during the periods of stupor.

POPULATION STUDIES

A considerable amount of energy has been expended in trying to determine whether different psychiatric classifications display discernibly different ECG patterns. Winton and Wallace(42) compared the incidence of abnormalities in psychoneurotic patients and young aviators, and found significantly more deviations from normality in the psychoneurotic group in the following: right heart strain pattern (tall P waves, ST depressions); flat or inverted T waves in leads I and II; ST depressions of at least 0.5 mm. in leads I and II. Many investigators have searched for ECG abnormalities in the syndrome called neurocirculatory asthenia, but reviews by White, Cohen, and Chapman(40) and Logue, Hanson, and Knight(20) gainsay this hypothesis.

In reviewing ECG changes in mental illness, Ruskin, Ravel, and Beard(31) list as changes associated with such illness: shortened PR intervals, depressed ST segments, and flat, inverted, or diphasic T waves. Plice and Pfister(29) also noted in a psychotic population T wave and ST segment changes which could not be ascribed to cardiac disease. Major(24) studied 53 psychotic patients with no evidence of cardiac disease and found shortened PR intervals, abnormal, especially diphasic T waves in lead III, and ST segment depressions, to occur more frequently in this population than in a nonhospitalized one. He concludes that these symptoms result from imbalanced autonomic activity which causes alterations in the myocardial innervation and in the coronary blood supply. The ECG abnormalities diminished in several of the patients whose psychiatric status improved. Similar data are adduced by Blom(3), who also reviews some of the earlier work. Heyer, Winans, and Plessinger (10) observed an abnormal incidence of low or diphasic T waves and lengthened PR segments, indicating both sympathicotonia and vagotonia, but Oltman and Friedman(28), in an ECG study of 812 patients, failed to find in them a significantly higher incidence of abnormalities than in normals. They also found no significant ECG changes following lobotomy, although heart rate changes were definitely established.

Summary and Conclusions

Many investigators have reported that persons under emotional stress display characteristic electrocardiographic changes. Some of these reports are reviewed to determine whether any generalizations are evident. From the published data, it appears that case and population studies overlap considerably with respect to the effects on the ECG of transient and prolonged emotional stress. In the majority of the studies, the following changes were correlated with a state of emotional tension: (1) Increased P wave amplitude; (2) depression, inversion, or distortion of the T wave; (3) ST segment deviation. These changes are associated with increased sympathetic tone, although several reports suggest that parasympathetic influences are also active(23, 10).

At least two cautions should be observed in connection with these statements which give them the status of hypotheses rather than conclusions. First, case studies tend to deal with atypical individuals, and there is little assurance that their records do not merely represent rarer but still normal ECG patterns. Second, in the population studies, the effects of the institutional regimen (diet, exercise, therapeutic procedures, etc.) are surely confounded with the emotional factors.

The experimental studies, largely because of the insufficient analyses that were performed, reveal no definite trends. However, a method for experimentally testing the hypotheses stated above should not be difficult to design. A conditioning paradigm, such as used, for example, by Schoenfeld and his associates(26, 27) and by Zeaman and Wegner(43) offers one means for doing so. In such an experimental design, the conditioned stimulus may be a light, a buzzer, etc., and the unconditioned stimulus a painful electric shock or other noxious stimulus. ECG changes may be particularly useful in comparing the course of extinction in Pavlovian and instrumental avoidance conditioning. In Pavlovian (classical) conditioning, the unconditioned stimulus invariably follows the conditioned stimulus. In avoidance conditioning, the noxious stimulus is prevented if the subject makes the appropriate response. As a result, the extinction of an avoidance

response is usually a quite prolonged process, since the subject has no way of knowing that the painful stimulus no longer follows the warning signal if he continues to respond correctly. One may look upon this as a simple experimental analogue of what is generally defined as anxiety—the anticipation of pain—and conceive the reinforcement for responding to be a reduction of fear or anxiety. Indeed, such a set of experimental conditions produces anxiety so severe that even with occasional failures to respond it may require hundreds of trials—sometimes thousands—to extinguish the overt response; and, even then, the autonomic activation may still persist. It is therefore quite possible that such an approach may yield data of considerable clinical value.

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THE EFFECT OF MESCALINE ON DIFFERENTIATED CONDITIONAL REFLEXES[1]

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Experimentally produced neurosis in animals was first described by Pavlov(16, 17) in 1913-1922. Since then, this experimental or situational neurosis has been observed by many investigators using methods of conflicting conditional stimuli, excessive stimuli, or changes in other external factors(7).

However, one drawback in applying the results of these experiments to humans and clinical psychiatry is that these methods are not applicable to the production of artificial human neurosis. In order to draw a more fruitful analogy between human and animal psychopathology it is necessary to use a common method in producing experimental behavior disturbances in both species.

Mescaline is useful in this respect. Psychological effects have been described by many workers including Beringer(1), Zucker(26), Klüver(14), Stockings(23), and Guttman (10), and it has been the most widely used method of producing drug induced experimental neuroses and psychoses in humans. Some psychiatrists suggest that mescaline produces an intoxication rather than a real psychotic state even though this occurs with a clear sensorium. Recent studies by Hoch (11, 12) and his collaborators have revived interest in its use as a psychiatric research tool. They found it produced schizophrenic-like symptoms in normal humans and accentuated the symptoms of schizophrenic patients. Among the psychological effects of mescaline, Hoch describes hallucinations, delusions of a paranoid, grandiose, or hypochondriacal nature, depersonalization experiences, disturbances of thought and negativism. These symptoms are accompanied by lack of insight and amnesia for the events. High doses produce catatonic reactions.

Vogel(24) describes mescaline's neurophysiological effects as mydriasis, flushing of the face, elevation of blood pressure, increased sweating, tremors, exaggerated tendon reflexes, occasionally clonus but no Babinski, and reduction of Alpha waves in the EEG with increased prominence of low voltage fast activities.

Biochemical and pharmacological studies on mescaline have been published. Quastel (18) noted that it depresses the normal oxidation processes and glucose metabolism of the brain. Grace(9) found it a depressant on the central nervous system. Its effect of lowering blood pressure was abolished if the vagi were cut or atropine administered. Mescaline's depressant effect in this regard seemed to be rather specific for the cerebral cortex since in decorticate cats it produced a rise in blood pressure. For anesthetized dogs small doses raised the cardiac rate while high doses slowed it. Recently Marrazzi and Hart(15) described mescaline's ability to produce an inhibition of the synaptic transmission. None of these studies, however, measured its effect on conditional reflexes.

Mescaline was administered to dogs by de Jong(13) who stated that it produced disturbances similar to negativism and catatonia. This was recently confirmed by Seevers(19). Among the disturbances described by de Jong were diminished motor initiative without paralysis, negativism as measured by resistance to change of position, the assumption of abnormal and bizarre postures, and particularly the maintaining of the front legs in a crossed position when placed that way. Thus in mescaline one has a common method of producing experimental neurosis in both animals and humans. We thought it exceedingly important to make a controlled study of the basic neurodynamic action of this drug, for, as Solomon(20) states, it is possible to assume that fundamentally the mechanism of origin of natural and experimental psychotic phenomena is a similar one.

Since the quantitative determination of conditional reflexes has been shown by Gantt (25) to be an accurate and controlled index

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of cerebral functioning, this method was employed in our study. Similar experiments on the action of alcohol, caffeine, bromide, chloral, amytal, benzedrine, and morphine have been already published (4, 6, 21, 22, 25).

METHOD

Our method has been described in detail by Gantt (7). The dogs were placed in an experimental camera which was designed to prevent stimuli other than the conditional stimuli from interfering with the tests. While the motor reflexes were measured, cardiac and respiratory rates were taken by means of an electrocardiograph and pneumograph. The conditional stimuli (CS) used were 2 tones produced by an audio-frequency oscillometer, T256 and T512, with an octave difference between them. The reflex studied was the defense or pain reflex which was produced by the unconditional stimulus, US (a faradic shock to the skin), which produced the unconditional reflex, UR, flexion of the foreleg and accompanying cardiac, respiratory, and general behavior changes. Both tones or signals lasted for 5 seconds. T256, which was always followed or reinforced immediately by the US or electric shock, became the positive or excitatory stimulus, and T512, which was never reinforced, became the negative or inhibitory stimulus as differentiation developed. The flexion of the foreleg during the CS and the accompanying cardiac, respiratory, and behavioral changes were observed as conditional reflexes, CR's. A stable level of response was established with regard to the following variables: the general behavior of the animal; the character of the subcortical orienting reflex; the latent period of the conditional reflex (the time between the CS and the CR); the amplitude of the CR; the amplitude of the UR; the percentage of correct motor reflex responses; and the percentage increase or decrease in the accompanying cardiac rate.

Four dogs were used; 2 had been used in our Pavlovian laboratory for other experiments and had well-established, stable defense reflexes. These were Skipper, a female mongrel 5 years old, weighing 17 kg., and having 1,000 repetitions of the CS, and Butch a very excitable male, 6 years old, weighing 14 kg., and having 400 repetitions of the CS, and good differentiation after 75 of them. Two other dogs were procured from the pound for this study and a stable level of conditional reflexes had to be initially established. These were Chow, a male mongrel, age 2, fairly excitable, who had 375 repetitions of the CS with differentiation after 180 of them, and Rocky a 2-year-old lethargic male mongrel who had 375 repetitions with differentiations after 100 of them. Chow, whose initial heart rate was 40/min. developed and maintained a heart rate of 180/min. on 375 repetitions of the CS. Experimental tachycardia had been observed previously in this laboratory by Dykman and Gantt (3).

All these dogs had 100% correct motor responses (always lifted their legs to T256 and never to T512) and obviously significant cardiac changes with T256. After 10 control records were collected and found to have little variance, different dosages of mescaline were administered and the effect noted. During the control period intramuscular saline was given so that any change occurring would be due to the mescaline alone and not to the injection procedure.

RESULTS

Results are listed in the accompanying table. The percent motor responses pertain to the incidence of foot flexions during the control and mescaline periods with 20 repetitions of the CS in each case. The percent cardiac change is the mean of the percent change of heart rate (increase or decrease) during 20 repetitions of the CS as compared with the 5-second period before the CS. Since the control percentages, which were recorded the day before the drug experiment, were the same as the measurements of the 200 preceding stimuli repetitions, we believe the marked change under mescaline is significant and is due to the drug and not the chance variance.

As shown in the table, the effect of mescaline varied with the dose. The drug was administered intramuscularly, which, according to Seevers (19), gives approximately the same plasma levels as intravenous administration. Hoch (11) used a dose of 7 mg/kilo i.v. in humans to produce schizophrenic-like symptoms. This dose in our dogs had little effect on the conditional reflexes except per-

haps to increase the size of the cardiac change. The dogs also began to exhibit a peculiar chewing motion that became marked with higher doses.

When the dose was increased to 35 mg/kilo definite changes appeared (Table 1). The motor responses were slightly diminished as measured by percent responses,

TABLE 1

Dog	Measurement	Control		Mescaline 7 mg/kilo		Mescaline 35 mg/kilo		Mescaline 70 mg/kilo	
		Excitatory T_{256} %	Inhibitory T_{512} %	T_{256} %	T_{512} %	T_{256} %	T_{512} %	T_{256} %	T_{512} %
CHOW									
	Withdrawal of foot to stimulus....	100	0	100	0	90	0	0	0
	Cardiac rate change with CS.....	19	−7	28	−5	2	−4	−1.5	−5
	Cardiac rate change with US.....	24	—	23	—	12	—	3	—
ROCKY									
	Withdrawal of foot to stimulus....	100	0	100	0	90	0	40	0
	Cardiac rate change with CS.....	20	4	28	5.3	3.3	1.6	−4.6	−1.4
	Cardiac rate change with US.....	38	—	28	—	15	—	9	—
BUTCH									
	Withdrawal of foot to stimulus....	100	0	100	0	100	0	20	0
	Cardiac rate charge with CS.....	14	−4.5	21	−4	5.5	−6	−5.5	−6
	Cardiac rate change with US.....	9.3	—	15	—	16	—	7.5	—
SKIPPER									
	Withdrawal of foot to stimulus....	100	0	100	0	80	0	0	0
	Cardiac rate change with CS.....	38	0	58	0	−2	−2.1	−2.5	−3.5
	Cardiac rate change with US.....	38	—	69	—	3	—	5	—

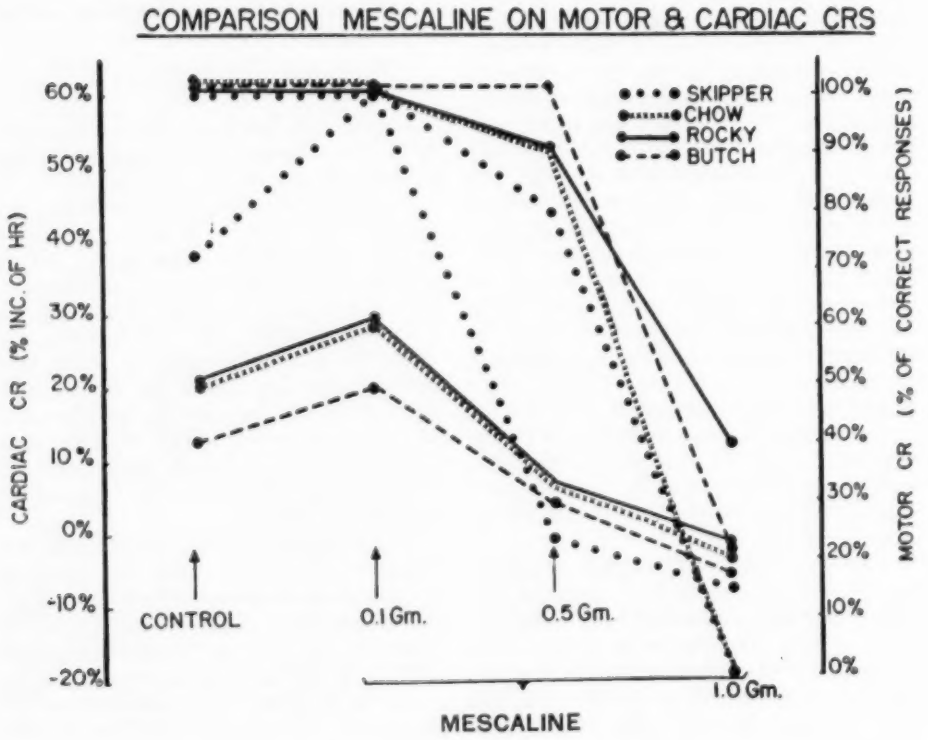

FIG. 1

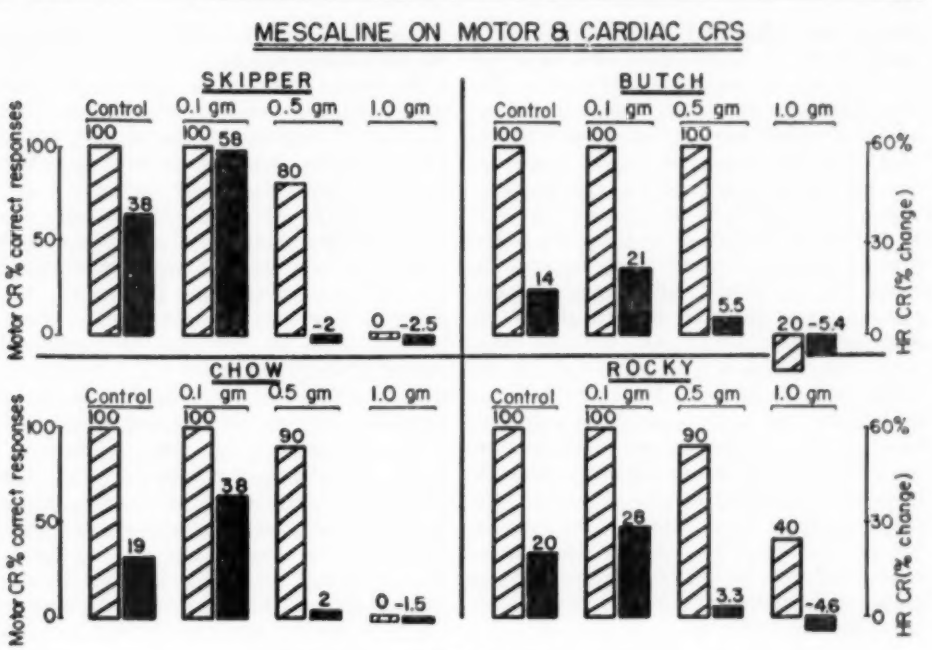

FIG. 2

decrease in amplitude, and increase of latent period. However, with this motor reflex relatively intact there was complete inhibition of the cardiac component of the excitatory conditional reflex. A split between motor and autonomic functions under morphine had been observed previously by Gantt(21, 22), but, under morphine, it was the motor response that was inhibited while the cardiac component remained intact.

In order to determine if the nature of the split was dependent on the character of the specific dog or the action of the specific drug, morphine was given to 2 of them. Under 5 mg/kilo of morphine, Skipper gave only 60% correct motor response but a 60% cardiac change. Rocky was given 4.6 mg/kilo of morphine and he gave only 20% correct motor responses while his cardiac change increased 42%. Thus the split under mescaline is directly opposite to that observed with morphine.

When the dose of mescaline was increased to 70 mg/kilo the conditional motor responses were also almost completely inhibited (Figs. 1 and 2); however, 2 dogs continued to give a small response. The unconditional cardiac reflex was also inhibited but the unconditional motor reflex, while diminished in amplitude, remained intact. The orienting reflex remained intact under all doses.

In respect to general behavior under the drug some very interesting phenomena were observed. During the control period 3 of the 4 dogs usually barked, howled, or yelped with the US or electric shock but rarely did so with the excitatory CS. However, under the effects of mescaline, they all began to squeal and howl with the T256, the excitatory stimulus, in the same manner as with the electric shock. These vocalizations were also recorded as changes in the respiratory reflexes on the pneumograph. Thus while the dogs did not give any motor or cardiac responses, they still showed 100% differentiation between the tones in that they howled and showed general emotional reaction with T256 while remaining very quiet with the T512. This howling with both the excitatory CS and the US did not occur under morphine.

Their lack of motor responses did not appear to be due to motor paralysis since they could easily run around the antecamera.

Among the behavioral disturbances noted was a state which has been described by de Jong(13) as similar to catatonia. The dogs would assume fixed bizarre positions with their hind legs rigidly extended and their heads bent low. They would remain in that posture for long periods as if in a trance and could be pulled *en masse* along the floor on all fours, a state which de Jong calls negativism. However, when finally coaxed to move, they ran fairly well in spite of some ataxia. A pan of water was brought to the mouth of one dog who drank insatiably. The pan was immediately removed and placed directly in front of him. He bent his head toward the pan and opened his mouth but never reached the water, remaining in that straining position for 10 minutes, although he showed no motor paralysis and was still thirsty since he drank eagerly when the pan was again lifted to his mouth. Other symptoms noted were mydriasis, peculiar chewing movements, hyperactive knee reflexes, and intact placing reflexes.

In respect to the inhibitory effect of mescaline on the conditional and unconditional cardiac reflex, it was not a direct action on the cardiac system alone, but seemed to be related to the animals' reaction to external stimuli; for in 3 dogs the general heart rate without stimuli rose some 25%, and in one it remained constant under mescaline.

Discussion

In this experiment mescaline produced a state of inhibition (the excitatory conditional reflexes were inhibited) as well as a quantitative dissociation or cleavage between the emotional (visceral) and superficial motor responses, the cardiac reflexes being abolished before the motor. This relation between inhibition and dissociation was noted in many instances by Pavlov(16, 17). He produced a state of hypnosis in his dogs by repeating inhibitory stimuli and observed a divergence between the secretory and motor components of the food reflex. The saliva began to flow when the food was given although no skeletal movements were made in the direction of the food, and the reverse was noted when the conditional salivary reflex disappeared, but the motor reflex to food and chewing remained normal. He also noted that under this state of inhibition or hypnosis the dogs manifested negativism and catatonic traits similar to those we found under mescaline. A dissociation or cleavage between the various systems that the animals use in responding to their environment was also found in neurotic dogs by Pavlov(16, 17) and Gantt(5, 8). This disharmony was called "schizokinesis" by Gantt(8) and postulated as one of the basic mechanisms underlying psychopathy. Pavlov(16, 17) thought that many symptoms of schizophrenia could be explained by a state of partial inhibition or hypnosis. The production of inhibition and schizokinesis under mescaline supports these 2 viewpoints.

One interesting phenomenon that occurred under mescaline was the manner in which this disorganization was manifested. Along with the inhibition of the motor and cardiac reflexes there occurred the accentuation of the "emotional" vocalizations during the conditional stimuli. These vocalizations were of the same quality as those exhibited with the unconditional stimulus. The dogs reacted to the CS tone as if it was the US or electric shock itself.

Based on this peculiar phenomenon, we suggest a neurodynamic hypothesis that under the inhibiting effects of mescaline and its resulting schizokinesis, the normal relations between CS and US are disturbed and the CS begins to have an effect on the animal as if it were the US—the signal for reality comes to act as if it were reality itself. Such dissociation in response appears to explain many of the symptoms seen in disturbed behavior.

Gantt(7) has described the ease of development of pathological CR's in neurotic animals. In normal dogs the CS has to be combined with the UR in order to become established as a CR. However, in neurotic dogs, any new or neutral stimulus has to be combined only with a CS for pathological behavior, and it itself then becomes a pathological CR. This development of disturbed behavior going on without the benefit of the original excitant has been called "autokinesis" by Gantt(8). The above-mentioned hypothesis may help explain the mechanism of this phenomenon. Each new pathological CS acts in the neurotic dog in a manner simi-

lar to the original traumatic US. Thus while reinforcing itself, it produces new pathological CR's from the neutral stimuli. In this way the behavior disturbance has almost unlimited possibilities of spreading to involve new organ systems and new aspects of the environment. Pavlov(16, 17) described neurotic dogs who had CR's that had a quality of pathological inertness—could not be extinguished by nonreinforcement. This may be caused by the conditional stimuli acting like unconditional stimuli and thus reinforcing themselves.

Before applying the results of this experiment to humans and their clinical syndromes, we mention Pavlov's(16, 17) theory concerning the higher nervous activity of human beings. He felt that, in common with animals, humans had UR's (inborn reflexes or instincts) plus primary conditional reflexes formed from a first system of signals of reality (such as sensations, perceptions, or direct concrete impressions of their environment). In addition, he believed that human beings have a second system of signals of reality including speech, ideas or verbal thoughts, generalizations and abstractions. These are the "signals of the first signals" of the above-mentioned primary system. Pavlov states that direct impressions of objects and phenomena of the external world are the first signals of reality and that the verbal symbols or verbal designations of these direct impressions are the second signals of reality. Normally the first and second signal systems are in harmonious interrelationship with one another.

In our laboratory mescaline administered to dogs produced a disorganization of the normal relations between the CS and the US, and we postulated that the CS began to act in a manner similar to the US. Extending this hypothesis to human beings it is possible that mescaline produces a disharmony or schizokinesis of the normally coordinated 3 systems of highest nervous activity—the unconditional or inborn reflexes and the first (CR) and second (verbalization) signal systems. Furthermore, with the production of disorganization, just as the primary CS comes to stand for the more primitive US in dogs, in humans the secondary system of words, ideas, abstractions, and generalizations comes to act like the more primitive, primary CR system of concrete perception of stimuli. Thus verbal concepts or abstractions of reality come to act like direct impressions of reality itself.

This neurodynamic theory may be applied to explain certain of the phenomena seen in various states of inhibition such as sleep or hypnosis, as well as some symptoms of psychopathology. During sleep the second signal system of ideas acts like reality itself and is perceived as the true perception of dreams. While asleep, what one thinks about seems to be really happening. Under hypnosis, with its great ease of suggestibility, the secondary signal acts like the primary or even the unconditional stimulus, and the words or ideas act like reality. As for example in Platanov's(2) work with hypnosis the words "you are drinking" comes to mean the subject is really drinking and a diuresis naturally occurs. Similarly in conversion hysteria and hypochondriasis the idea comes to stand for reality—the idea of a bodily ailment produces the physical symptoms of this ailment.

As for the schizophrenic-like symptoms of mescaline, their description by Stockings (23) and Hoch(11, 12) tend to support this neurodynamic formulation. Hoch states that the contents of the hallucinatory experiences under mescaline were present in a very similar form in dreams and free associations prior to the drug-induced state. The auditory hallucinations usually started as an idea and then the concept is projected and heard from the outside. Occasionally the patient relived actual traumatic experiences. Solomon(20), in describing drug-induced symptoms, says that a phantasy or an illusion, in the process of psychologic dissociation, may appear to the subject as a real object outside himself, and thus constitute an hallucination. Stockings(23) writes that the hallucinatory content was in line with past mental experiences—wish fulfillment fantasies and childhood memories. He describes it as a hypertrophy of the imagination, first appearing in the mind's eye, and then dissociated and appearing as a real object. The thoughts became split off and talked back as voices. Objects seemed to stand out and have a special reference for the subject; instead of being

abstract they became concrete. Sounds seemed very clear and to have a specific meaning for the individual.

Here, again, in hallucinations, the ideas—the second signal system—act like the primary signal system—sensations, perceptions, reality. What was once an idea or daydream becomes under mescaline what seems like reality or an hallucinatory experience.

Normally, ideas that are not reinforced by reality or experience become extinguished. However, in an inhibitory and disorganized state, such as that produced by mescaline, the ideas appear as reality and thus reinforce themselves, becoming fixed delusions, obsessions, and compulsions. To the subject's mind these ideas or secondary signals are accepted as experience or sensations; and so long as they are perceived as primary signals (reality), they do not become extinguished. Further there is a disturbance of thinking in which the individuals lose their ability to generalize—the secondary signal system of words becoming concrete, and acting as direct literal impressions rather than abstractions.

Summary and Conclusion

Mescaline produced an inhibitory state accompanied by a schizokenesis or dissociation of systems. This disharmony was also manifested in that the CS appeared to act in the same manner as the US. On this basis a neurodynamic theory of the mechanism of mescaline's actions is postulated: that under mescaline intoxication and in some mental illnesses, a dissociation of the second and first signaling systems and the unconditional reflexes occurs in which each signaling system acts as if it were the same as the more primitive system on which it is based. The secondary signals—words and ideas—come to act like the primary signals of sensations and direct impressions of reality. This theory may help explain certain psychological phenomena, *e.g.* dreams, hysteria, compulsions, delusions, and hallucinations. While the content of these phenomena depends on the personality of the subject and all the environmental factors that determine this personality, their mechanisms are physiological, regardless of whether one prefers a pathophysiologic or psychogenic etiology. Based on our experimental findings and the work of others, a neurodynamic pathogenesis of the psychological effects of mescaline is described.

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DISCUSSION

Herman C. Denber, M. D. (New York City).—This paper can be studied from 3 vantage points:

(1) The preliminary hypothesis; (2) the experimental data; and (3) the concepts derived therefrom.

There is some confusion regarding the exact role of mescaline in the experimental production of various states of abnormal human behavior. The words "experimental neurosis" and "experimental psychosis" are used interchangeably. These authors state that symptoms of the mescaline-induced state are accompanied by a "lack of insight, and amnesia for the events," and that "high doses produce catatonic reactions." They emphasize the motor components and negativistic behavior of the animals.

In a strict sense, the injection of mescaline in humans produces neither an intoxication, nor a neurosis, nor a psychosis. It is a state of being in which occur behavioral changes ranging from normality to completely disorganized mental states, and from sleep to murderous rage. Use of the words neurosis or psychosis without strict definition only tends in this type of experimental approach to lead to further uncertainty.

The mescaline experience is vividly recalled, for subsequently patients have described it as a "horror or torture chamber," an "emotional brain wash," a "cleansing process," a "purification," and either "an airplane ride" or " a 4-engine transport on the flight line before take-off with all 4 motors going." Of 40 patients who received intravenous injections of mescaline, the majority stated that they would not like to have another. A few requested additional treatments since they felt it helped them in understanding their problems. My own reaction to orally ingested mescaline was that once was enough for science, and twice would definitely be an imposition. The marked insight developed by many patients during the mescaline experience has a beneficial effect upon their illness.

Since the mescaline state in humans is accompanied by autonomic, sensory, motor, thinking, and emotional changes, and since Drs. Bridger and Gantt do not describe much beyond motor and some little emotional changes, it is questionable whether one can really compare the mescaline state in man and dog. Tension and anxiety, almost constant precursors of the mescaline-induced state in humans, seem to have been absent in the dogs. The effect of increasing doses of mescaline upon the conditioned reflex suggests that the mechanism in dogs is not the same as in humans. Variations of dosage in humans does not influence the clinical response. I have seen violent emotional reactions with 0.05 grams and no response with 0.5 grams. Catatonic reactions in humans can be produced by the same dose (0.5 grams) that produces acute rage or sleep. The type of reaction appears to be more a function of the individual's life experience. Negativism and catatonia are unusual in humans, but appear to be the chief response in dogs.

The variability of response to mescaline in humans raises a serious problem as to the applicability of concepts drawn from data on 4 animal subjects of any species. The data of the experiments reported today are not clear-cut. The abolition of conditional responses under mescaline is not total. It may be that in a large number of animals there would be a gradation of responses from complete extinction to no extinction of the conditional reflex. The experimental setting "was designed to prevent stimuli other than the conditional stimuli from interfering with the test." Can formulations derived from this experiment be compared to any life situation with its multiplicity of stimuli, internal and external, playing upon the individual?

The work of Altschule, Bower, and Cook has shown that chlorpromazine hydrochloride effectively suppresses conditioned reflexes in rats. This substance also blocks the mescaline-induced state in humans. One produces abnormal behavior and the other antagonizes abnormal behavior. These 2 mutually antagonistic compounds have the same action; they block the conditioned reflex. The effect of these drugs, and undoubtedly others as well, would therefore seem to be nonspecific.

Emphasis is placed upon the fact that the cardiac component under mescaline in dogs is completely inhibited, while the motor portion of the conditional reflex remains intact. These authors found an inverse split under morphine, although they have not discussed its specific meaning in terms of the psychological concept they propose. Have other drugs been tested to determine if such a split takes place? If morphine produces a dissociation of the emotional and motor components of the conditional reflex, this represents schizokinesis. Since morphine does not produce symptoms of schizophrenia, is it appropriate then to state that "the production of inhibition and schizokinesis under mescaline support the theories" that have been proposed? The emphasis is on a cleavage between emotional, visceral, and motor components. Observation of psychotic patients shows a dissociation in one sphere only—the emotions. Feelings and thoughts are dissociated, for when a schizophrenic patient responds to his anxiety without symptom formation, the result may be disastrous.

To straight-jacket human behavior with its inherent variability and fluidity into signal systems under the guise of being physiologically determined is hardly conducive to further understanding of an already complex subject. Mescaline "produces a disharmony or schizokinesis of the normally coordinated 3 systems of higher nervous activity," only if one considers human behavior in a physiologic Pavlovian frame of reference, forgetting the tremendously complex interplay of environmental forces from birth onward and, as some claim, even before birth.

These authors have not made it clear why the dogs responded to the conditional stimulus as though it were the unconditional one having assumed *a priori* that the basis was physiologic. We who work with humans are more fortunate, for we can ask our patients why they do things. The concretized dichotomy of first and second signal systems is not verifiable clinically—at least not if one adds a psychodynamic frame of reference; which one must do in order to consider the problem of human behavior from a holistic viewpoint. The "verbal concepts or abstractions of reality come to

act like direct impressions of reality," only because one observes the phenomenon of the mescaline-induced state in a straight descriptive sense. The hallucination or delusion is not a concrete realistic phenomenon, no more than is "the idea of bodily ailment producing the physical symptoms of conversion hysteria and hypochondriasis." The delusional symptoms of the mescaline-induced state frequently dissolve when the patient associates the conflict-producing thoughts that have engendered them. As a matter of fact, in a majority of patients, mescaline rather than producing schizokinesis, induces a synthesis of emotions and thoughts precipitating an overwhelming emotional discharge associated with the verbalization of conflicts. The delusion or hallucination then is a mirror of the unconscious. As the patient responds to these "concrete" visions, his anxiety rises to a crescendo, and is then discharged, for he is then looking at himself, a self long hidden.

In this sense, mescaline produces neither a state of inhibition nor a dissociation, but rather a synthesis. Recall of memories takes place on a physiologic base still poorly understood. With intense and unbearable anxiety as a fulcrum, peripheral stimuli assume meaning in conformance with past experiences. Mescaline reduces or dissolves the ego defenses so that feeling is discharged with thought. A circle is then set up with the periphery acting as a trigger.

If this concept is correct, then any agent capable of blocking afferent stimuli should break up the circle and dissolve the mescaline-induced state. Chlorpromazine is such an agent, a fact confirmed recently by Hoch.

While most will agree that the fundamental mechanism of psychic phenomena is physiologically determined, until such time as the genetic, anatomical, biochemical, cultural, and psychodynamic factors are unified, no theory, neurodynamic or otherwise, can be acceptable.

ROLAND FISCHER, PH. D. (Regina, Sask.)—There are 2 points I should like to raise: (1) How far is the mescaline experience specific for that substance? (2) What would be the outcome of the experimental results after the administration of a depot-mescaline, recently synthesized, and which would enable one to perform a "chronic" mescalinization experiment?

In connection with the first question, it is of interest to recall that Chosak in Russia used guinea pigs injected with mescaline. He describes strong passive defense-reactions and cataleptic states (he connects the latter with the ability of mescaline to cause hallucinations). He observed a total disappearance of the artificial as well as of the natural conditioned reflexes and a firm refusal of food. The described disturbances disappeared usually in a few days and the animals appeared again normal. However, even after months he observed a disturbance of the higher nervous activity (phasic, periodic disturbances). The most prolonged were the disturbances of processes of inner inhibition of differentiation and of extinguishing inhibition).

Iwanow-Smolenski mentions the bulbocapnine experiments of Kotljarewski on rats. Experimental catalepsy was produced; first the conditioned (defense) reflexes disappeared, then also the unconditioned ones (food and orientation reflexes) for a few hours. After that the animals behaved normally again, but their conditioned reflexes showed a state of inhibition, first complete, later in phases for 3-5 days, and finally the processes of inner active inhibition (differentiations) were restored. These results appear to corroborate those obtained by Drs. Gantt and Bridger.

Generally all these and other intoxications (caused by staphylococcal, streptococcal, diphtheria, and typhus toxins or as a result of allergic states or tetraethyl lead poisoning) show, as claimed by Iwanow-Smolenski, that the *inhibition phase* which affects first the youngest, artificial C.R.'s, then the natural C.R.'s, goes over to the unconditioned reflexes, and in connection with this then affects the subcortical functions. It is evident that the inhibition retraces the path of evolution from the youngest to the oldest forms of nervous activity. Such reasoning arrived at by experiments producing an experimental or model psychosis also lends some support to my concept which regards schizophrenia as a regressive process of adaptation.

This concept is also supported by our recent findings which help us to regard the metabolic pattern of healthy people during the night as equivalent to the metabolic pattern of certain schizophrenics during the daytime.

The above point of view fits in with the Pavlovian concept of Drs. Bridger and Gantt, according to which, during sleep, mescalinization, or, in certain schizophrenic states, the second signal system of ideas, acts like reality itself.

As to the second point, if we assume that there is a chemical mediation of the schizophrenic syndrome, then it also seems advisable to perform "chronic" mescaline experiments. Jatzkewitz in München recently synthesized a depot-mescaline which is chemically tied to polyvinylpyrrolidon; this complex provides, after a single administration, a steady daily dosage of very small amounts of mescaline into the blood stream for about 3 weeks. It would be interesting to see the outcome of the experimental results described by Drs. Gantt and Bridger after repeated administration of this depot-mescaline. It might be that the organism then would respond with the formation of an adaptive enzyme (system) able to metabolize the drug. Such experiments might serve as a model for the increased resistance toward various drugs of the chronic schizophrenic.

A final point—there are many reasons which make me believe that the intact mescaline molecule is not, in itself, an active substance.

Let us hope that the present renaissance of mescaline research will contribute to the elucidation of this and other related intriguing problems.

THE NATURE AND SIGNIFICANCE OF BRAIN DAMAGE FROM ALCOHOLISM [1]

FREDERICK LEMERE, M.D.,[2] SEATTLE, WASH.

It has long been known that prolonged heavy drinking can cause permanent damage to the brain. In its advanced stages this is manifested clinically by deterioration of the personality and at autopsy by gross atrophy of the cerebral cortex. Courville(1) has recently published an excellent book on the neuropathologic findings in chronic alcoholics based on his extensive experience at the Los Angeles County Hospital. He states:

> One of the more common noteworthy effects of repeated alcoholic episodes or of chronic alcoholism from constant excessive drinking is a progressive atrophy of the cortex of the frontal lobes. This change affects specifically the convolutions of the dorsolateral surface of this lobe. This reaction to chronic alcoholism seems to be one resulting from the toxic effects of ethanol rather than malnutrition (avitaminosis). In the experience of the present writer, it is the most common cause of cerebral cortical atrophy in the fifth and sixth decades of life. It may appear as early as the first few years of the fourth decade.

That irreversible cerebral pathology can be found in even young alcoholics in their thirties is confirmed by the observations of Tumarkin, Wilson, and Snyder(2). They demonstrated brain damage by means of pneumoencephalography, electroencephalography, and psychologic tests in 7 young soldiers (average age 32 years) who had indulged in repeated bouts of heavy drinking. Pneumoencephalographic evidence of cortical atrophy is often found in older deteriorated alcoholics. Pluvinage(3), for example, found cortical atrophy in every one of 17 such cases on whom he did air injection studies.

While there is no question that repeated excessive drinking can and often does produce permanent brain damage, the extent of such damage among alcoholics is unknown. When one considers, however, that cerebral cortical atrophy is the end product of a gradual insidious dissolution of large numbers of brain cells, one comes to the inescapable conclusion that for each alcoholic with demonstrable pathology there must be thousands in the intermediate stages of damage. Current methods of evaluating organic cerebral impairment are still somewhat crude and do not permit detection of intervening degrees of cellular loss which must nevertheless be present in many heavy drinkers.

In addition to the direct effect of alcohol on the brain, there are other closely related factors which aggravate the damage to the brain. Among these are anoxia from the cerebral vascular congestion produced by alcohol, the high incidence of repeated head injuries, the obscure but probable toxic effects of liver cirrhosis and the malnutrition that so often accompany heavy drinking. Vitmain B deficiency is especially noteworthy in this respect and is chiefly responsible for the rarer but not uncommon complications of alcoholism, such as, Wernicke's hemorrhagic encephalopathy, Korsakoff's psychosis, and alcoholic pellagra. The atrophy of the corpus callosum found in Marchiafava-Bignami disease is now considered to be due to a combination of malnutrition and some, as yet undefined, toxic agent present in crude Italian red wine.

It is my opinion that brain damage from alcoholism is not only more common than is supposed, but that it also explains to a large extent the essential pathology of alcoholism, namely, the permanent loss of control over drinking.

In spite of many attempts to delineate the alcoholic personality, there remains only one characteristic that is common to all alcoholics and that is that they drink too much. It is my opinion that this inability to drink moderately lies at the heart of the problem of alcoholism. It is also my belief that the gradual loss of control over alcohol, that is the history of most alcoholics, is often the result of a gradual whittling away of brain cells by excessive drinking.

It is interesting that the part of the brain which suffers the most from alcoholism is

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that part which subserves the highest cerebral functions of will power, judgment, and control, namely the frontal lobes. Inasmuch as these same cells are also the first to be anesthetized by alcohol, it is logical to assume that with progressive destruction of the frontal cortex less alcohol will be required to produce that stage of anesthesia where control is lost. Eventually the stage is reached where any alcohol will result in loss of control. Few alcoholics intend to drink too much, but once alcohol is in the system there is an immediate paralysis of the control centers of the brain and the alcoholic is left helpless to stop after the first drink. This is why the alcoholic must never take even one drink if he is to retain control over alcohol.

It is also axiomatic that abstinence must be permanent. The reason for this is that brain cells once lost are never replaced, for irreversible damage is permanent when it involves the central nervous system.

It should be emphasized that for a long time and in fact in most alcoholics the brain damage manifests itself only in loss of control over alcohol. It is only in deteriorated alcoholic patients that any intellectual defect is noted in the sober state. If the alcoholic stops drinking before too much damage has been done, he will still be able to function normally as long as he assiduously avoids alcohol.

Contributing to the loss of control over drinking are several other important factors. One of these is the psychologic urge to drink for escape from personal problems. Personality disturbances are only contributory, however, for even when these are corrected by therapy the true alcoholic can still never again drink moderately. Another contributory factor to loss of control is a constitutional vulnerability to alcohol. Although we know very little about the reasons for this, common knowledge tells us that there are wide differences in individual tolerance to alcohol. In some patients an idiosyncrasy to alcohol is noticed almost from the very beginning of their drinking history. Susceptibility to the noxious effects of alcohol may in some cases be even more important in the development of alcoholism than the severity of the drinking or the associated personality disorders.

Conclusions

1. Prolonged heavy drinking can produce permanent brain damage.

2. This brain damage is responsible, in many cases, for the permanent loss of control over alcohol that is pathognomonic of alcoholism.

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SPINAL PUMPING THERAPY IN PSYCHIATRY

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For the last 20 years many reports have been published concerning the effects of "pumping" the cerebrospinal fluid (CSF) in various diseases, *e.g.* rheumatoid arthritis and rheumatic fever(1-7), various surgical diseases(8), tetanus(10), gynecological inflammatory diseases(9), Feer's disease(11), etc. Since 1949 various authors have reported their experiences with different modifications of spinal pumping methods in the treatment of mental disorders(12-14).

The therapeutic considerations leading to its clinical trial in various fields of pathology were based on Speransky's(16) theory stressing the neurologic factors in the pathogenesis of disease. Speransky's technic consisted of the withdrawal of 10-20 cc. of CSF by lumbar puncture and reinjection of the fluid fairly quickly under a certain pressure. This procedure ("pumping") was repeated about 10 times, after which about 8 cc. of fluid were withdrawn in order to prevent a possible meningeal reaction accompanied by mild increase of intracranial pressure.

Having applied this method to a comparatively large number of psychotic patients, Rey-Ardid found it free of serious dangers. Among side-effects this author listed marked vegetative reactions, particularly sympathicotony (mydriasis, perspiration, blotching, tachycardia, and elevated temperature) and mild meningeal reactions (headache, nausea, vomiting, tiredness, stiff neck, slight Kernig, and increased number of cells and albumin content of the CSF). In order to avoid even these transient untoward effects of Speransky's original method, Rey-Ardid modified the technic by omitting the reinjection of the withdrawn CSF. This author withdraws 10-20 cc. of CSF replacing it by the same amount of Elliot's fluid which has similar physical and chemical properties to normal CSF except for its lack of protein. Using this technic called "transfusion pump," Rey-Ardid was able considerably to decrease the duration and intensity of the side-effects. He applied both the original method and his modification for the treatment of recent and chronic schizophrenic psychoses and in a few other disturbed psychotic cases. In a considerable percentage of his cases Rey-Ardid saw far-reaching improvement in the manageability and sociability of his patients, and in some cases even remissions.

Rey-Ardid listed the following advantages of the method: (1) perfect harmlessness; (2) quick effect—result visible within 10 days; (3) no contraindications except increased intracranial pressure; (4) short duration, permitting choice of other therapeutic measures in case of failure; (5) no specially trained nursing staff required.

The aim of my investigation was to find out if the above methods could be considered a useful contribution to the treatment of disturbed psychotic patients, particularly chronic schizophrenias.

A group of 50 chronically disturbed male and female patients who had not responded, or only insufficiently responded to insulin shock therapy, electroconvulsive therapy, and to the newer drugs (reserpine, chlorpromazine) were selected. Of this group, 5 were submitted to spinal pumping, 7 to spinal pumping with addition of Elliot's fluid, and the remainder received transfusion pumping. In 10 cases it was necessary to sedate the patients prior to lumbar puncture.

The investigation was conducted as a "blind trial" since I had not known the patients on whom I performed the treatment, the assessment of results and side-effects being left to the physicians and nursing staff in charge of the patients.

Side-effects similar to those described by Rey-Ardid were noticed in 9 patients regardless of the method used. One patient who had had epileptic seizures before developed a seizure shortly after the treatment. No lasting untoward effects were noticed. Only 3 patients of the whole group showed a noticeable improvement in their behavior. However, all of these 3 patients had side-effects and had shown temporary spontaneous improvement prior to this trial.

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Discussion

In the present investigation the encouraging results published by Rey-Ardid cannot be confirmed. Our results were very poor. The pathophysiological mechanism of the method remains obscure. Speransky thought the effects were due to a true "massage" of the brain; Rey-Ardid hypothesizes mobilization of subarachnoidal and ventricular fluid with elimination of hypothetical toxic substances from certain areas of the central nervous system, with the possibility that the pituitary and pineal glands are influenced by the induced movement of the CSF, with an increased production of ACTH, and influences on the vegetative-hormonal centers due to changes in the dynamics of the CSF.

Since the percentage of improvements in my series was negligible, I shall not try to discuss the possible mode of action of the pumping procedures. However, the improvement of behavior could be connected with the general effects of a systemic disease (meningeal reaction and disturbance of the vegetative system), similar to that which used to be seen when pyretotherapy and protein therapy were used on a large scale. The results obtained by pumping procedures cannot be compared with those of the newly used drugs and therefore should be discarded from the therapeutic arsenal in psychiatry.

Conclusion

No noticeable therapeutic results were obtained in a series of 50 psychotic patients treated with spinal pumping procedures (Speransky's method). This method cannot be recommended for the treatment of psychiatric disorders.

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CLINICAL NOTES

PSYCHIATRIC ADMISSIONS TO A GENERAL HOSPITAL

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The increasing interest in psychiatric problems makes a brief summary of the emergency admissions to a suburban general hospital most timely. Such admissions often present very serious and urgent problems. This survey was prompted by the need for adequate facilities and trained personnel for the care of such patients.

METHOD AND MODE OF STUDY

The hospital chosen for this study, Mountainside Hospital of Montclair, New Jersey, a 315-bed general hospital serving a suburban area with a population of 150,000, was chosen because it is representative of thousands of similar institutions throughout the country. All emergency admissions requiring the services of a psychiatrist during a 2-year period were tabulated. If possible, each case was classified as to diagnosis and its disposition was also noted. The results appear in Table 1.

SUMMARY AND COMMENTS

A study of emergency psychiatric admissions to a suburban general hospital for a 2-year period is presented. Unfortunately cases listed as "attempted suicides" could not be classified as to diagnosis. Such cases received only emergency treatment and then either were discharged in care of a physician or were transferred to private or county sanitaria. The need for provision of adequate care for psychiatric emergencies must be stressed. In the area in which the hospital utilized for this study is located 2 programs are now under consideration to provide adequate care for such patients and to allow for their detainment for a sufficient time for careful evaluation. Under the first plan the county mental hospital would provide such facilities. If this plan proves not feasible then the general hospital will set up a unit for the care and study of these patients.

TABLE 1

RESULTS

Emergency Psychiatric Admissions for 1953

Diagnosis	Number of cases	
Psychoses		
Manic-depressive	2	
Schizophrenia	11	
Toxic psychosis	1	
Involutional psychosis	1	
Alcoholic psychosis	8	
Undifferentiated	8	
Total psychotic admissions		31
Psychoneuroses		
Hysterical reactions	2	
Depressive reactions	3	
Acute anxiety	1	
Total psychoneurotic admissions		6
Drug addicts		2
Acute Alcoholism		13
Attempted Suicides		34
Total emergency psychiatric admissions, 1953		86
Disposition of above cases		
Discharged	51	
Transferred to mental hospital	32	
Died	2	
Police custody	1	

Emergency Psychiatric Admissions for 1954

Psychoses		
Manic-depressive	1	
Schizophrenia	2	
Senile psychosis	3	
Involutional psychosis	2	
Alcoholic psychosis	2	
Reactive depression	1	
Undifferentiated	3	
Total psychotic admissions		14
Psychoneuroses		
Hysterical reactions	2	
Acute anxiety	3	
Total psychoneurotic admissions		5
Acute alcoholism		5
Attempted suicides		43
Total emergency psychiatric admissions, 1954		67
Disposition of above cases		
Discharged	44	
Transferred to mental hospital	23	

[1] Address: 70 Park Street, Montclair, N. J.

[2] Appreciation is expressed to Delia Early, R.N., for maintaining the records of all psychiatric admissions to Mountainside Hospital, Montclair, N. J.

CHRONIC MENTAL PATIENTS' REACTIONS TO OPENING THEIR WARD

DOROTHY SCOTT,[1] LAKELAND, KY.

Liberalization of custodial policies at mental hospitals has gained impetus during recent years. Increasingly, one hears of the establishment of patient government and "open wards."

It appears to us that some of the most energetic advocates of the open ward (particularly persons not having much contact with patients) believe that mental patients' reactions will be rather uniformly enthusiastic or favorable to unlocking the ward. However, when one reviews the predominating characteristics of continued-care patients, he will hesitate to predict in them an overwhelmingly favorable response to extending their freedom in this way. Chronicity too often involves reduced ability to change or adapt; increased dependency; diminished ability to respond emotionally; and impaired judgment and perception—of which the patient is frequently more or less aware.

We surveyed the reactions of 35 women patients some 3 weeks after their ward had been changed from closed to open status. Diagnostic categories were in the following proportions: schizophrenia, 71%; mental deficiency, with psychosis, 11%; chronic brain syndrome, with psychosis, 11%; and manic-depressive psychosis, 6%. Ages ranged from 22 to 69 years, (mean age 46). Mean duration of confinement was 12.8 years. These patients had been reviewed by staff physicians and pronounced suitable for the open ward. They may be described as quiet, rather predictable, comparatively well-preserved chronic mental patients.

We asked each patient whether things on the ward had changed in any way during the past few weeks. Twenty subjects (57%) had noticed no change, 14 patients (30%) reported having noticed change, and one patient was uncertain.

Asked specifically whether or not they like the open ward, 22 (63%) replied that they like the change. Nine patients (26%) said they prefer a locked ward; and 4 (12%) expressed indifference.

In discussing possible gains from opening the ward, no patient referred to a sense of increased freedom. Several mentioned increased convenience to the nursing personnel, and a few who have yard privileges stated that they preferred the new arrangement because it eliminated standing in line when entering and leaving the ward.

All 9 patients who expressed objections to the open ward indicated that they sensed the new situation as less secure. They commented that "just anybody could walk in" now that the door is unlocked. One patient said her persecutors outside the hospital could now get into the ward to do her additional harm. A few patients said they feared harm at the hands of other patients since, they assumed, the nursing personnel might be less watchful or sometimes absent under the new plan. It is noteworthy that no patient mentioned any connection between the change and his chances of going home.

Low interest in ward conditions appears to be more prevalent than our figures might suggest. It is interesting that during rather extensive rearrangement of parts of the ward in question, only 2 patients verbalized any interest in what was being done.

It was the impression of ward personnel that patients had become dependent upon close supervision during their years on closed wards and that many felt inadequate to make decisions now. The employees reported that about one-half of the patients had told them of fears and misgivings connected with opening the wards.

The data suggest these tentative conclusions: (1) many chronic mental patients may be expected to react negatively or apathetically to opening their ward; and (2) in general, chronic psychotic patients tend to view freedom with considerable difference from the way well persons view it.

[1] Central State Hospital, Lakeland, Ky.

IMAGINATION AS A FACTOR IN HYPNOSIS

W. EARL BIDDLE, M.D.,[1] PHILADELPHIA, PA.

Hypnotic phenomera have been known since ancient times but the nature of the trance is still debated. There are numerous theories presented in the literature, some bordering on the ridiculous. It is surprising, however, that attention has not been given to the one factor in the trance which appears to be most obvious: the operation of the imagination of the hypnotic subject.

Hypnosis is not an abnormal or supernatural process. Normal people spontaneously experience hypnotic phenomena in situations such as listening to a symphony, driving on a long trip, fishing or daydreaming, when reality testing is temporarily suspended. Any person can be taught to develop a deep trance if he has a facile imagination, sufficient will to concentrate, intelligence to understand and follow instructions, and confidence in the ability and trustworthiness of the hypnotist. Contrary to general opinion, weak-willed, indecisive, oversuggestible persons do not make good hypnotic subjects. The ability in trance induction lies not so much with the hypnotist as with the subject.

The trance is a state in which deliberately induced false perceptions become so vivid that they are accepted by the hypnotic subject as reality itself. This state is similar to that of the dreamer while he is experiencing the natural dream, or the psychotic person while he is hallucinating. The common factor is the presence of false perceptions which are the result of distortions of imagination. It is well known that psychotic and neurotic symptoms can be produced by hypnosis. Herein lies the greatest danger in the use of hypnosis by nonprofessional and inexperienced persons. There might be a moral risk if the motives of the hypnotist are questionable, but even the most righteous amateur may be responsible for the precipitation of a neurosis or a psychosis if he brings frightening unconscious experiences close to consciousness.

It seems that in some areas of psychiatry, imagination has been placed under a taboo as rigid as the Victorian restrictions against sex. Many psychiatrists do not use the word out of deference to the feelings of their patients. However, the scientist is expected to be objective. Imagination is an important *cognitive* function which must operate either consciously or unconsciously before any behavior is possible. The imagination presents the picture of the goal toward which the organism moves. Without it there could be no action, no behavior.

The research scientist needs to use his own imagination as a prerequisite to every research project, yet there has been very little research done on the function of imagination itself. The writer has successfully treated neurotic and psychotic symptoms by the constructive manipulation of imagination by means of hypnosis. It is also noteworthy that hypnosis provides a safe hallucinogen for the experiential study of mental symptoms. There is an interrelationship between imagination and hypnosis which deserves more research. Hypnosis offers a key to a better understanding of imagination, and more knowledge of imagination promises to give some answers to the questions about the nature of hypnosis.

[1] Philadelphia State Hospital, Philadelphia 14, Pa.

CORRESPONDENCE

ON THE APPRAISAL OF CLINICAL DATA

Editor, THE AMERICAN JOURNAL OF PSYCHIATRY:

SIR: That clinical data may sometimes lend themselves to a variety of interpretations is well recognized. Sampling or experimental errors, bias, placebo effects, ignorance or disregard of the natural history of the untreated illness, as well as ignorance or disregard of the relative effectiveness of other and competing methods of treatment, are the most important intruders. (Gold, H., ed. *How to Evaluate a New Drug.* Cornell Conferences on Therapy. New York: Macmillan, 1955; Beecher, H. K. J.A.M.A., 159: 1602 (Dec. 24) 1955.) This ambiguity in the interpretation of clinical facts is a serious and unsolved problem in psychiatric investigation, and is now aggravated by the oncoming of the "ataractic" or "tranquilizing" drugs.

A recent Preliminary Clinical Report (Denber, H. C. B., and Bird, E. G. Am. J. Psychiat., 112: 1021, June 1956) can serve well to illustrate the contradictory conclusions which are reached from the same data, and raises the question of the desirability in some instances for the appraisal of clinical data separately by qualified outsiders as well as by the reporting investigators. The particular report to which I refer dealt with the result of chlorpromazine treatment of 45 depressed state hospital patients, many of whom were hospitalized for many months. On the basis of their published data, the authors concluded that "the drug [chlorpromazine] is most effective when the depressive state is accompanied by psychomotor agitation." Since 39 (87%) of their 45 patients suffered from depression accompanied by agitation, their report can fairly be described as an uncontrolled clinical study of chlorpromazine treatment of depression with agitation in certain state hospital patients.

Now the main facts upon which the authors based their conclusion that chlorpromazine is "most effective" in the treatment of depression accompanied by agitation are these: "Fifteen patients were discharged, 22 showed varying degree of improvement, and 8 were unchanged." (The criteria for discharge are not given, but it would seem to be a fair inference that these discharged patients were recovered or much improved.) It should also be brought out that their patients were treated with chlorpromazine intensively and for an extended period. "Twenty-four patients were treated up to 5 months, with the remainder for periods as long as 14 months." Also 14 of their patients had been hospitalized for more than a year before chlorpromazine treatment was begun.

On the basis of the above data, the present writer comes to the directly opposite conclusion; these data indicate that chlorpromazine is ineffective in the treatment of depression accompanied by agitation. It is our opinion that the above results are essentially those which would be expected from untreated or placebo-treated controls. Finally, we should like to point out that nowhere in the report is mentioned the very high effectiveness of electroconvulsive therapy of depression with agitation. Since electroconvulsive treatment of depression is the most generally accepted, a comparison of the results of treatment with ECT and with chlorpromazine is at least relevant.

LAWRENCE H. GAHAGAN, M. D., PH. D.,
New York City.

REPLY TO THE FOREGOING

SIR: A brilliant dialectic maneuver of considerable magnitude has permitted Dr. Gahagan to establish that depression with agitation does not respond to chlorpromazine. It is the opinion of investigators throughout the world that chlorpromazine is effective in this disorder, although the evidence is more controversial for the adynamic or retarded

depressions. He states (personal communication) "... in private practice I can *safely* say that *probably* 90% of our depressed patients recover within a *few* weeks after a course of 10 electroconvulsive treatments. . . ." (Italics mine.) Dr. Gahagan bases his evaluation of the "natural history of the untreated illness" on personal experiences which do not include state hospital work. We are treating psychotic in-hospital patients and he has an office practice. Can we really compare a neurotic depression with a schizophrenic depression or a manic-depressive psychosis?

The title of our paper was clear-cut, and the material offered was relevant to the main question: What happened to those patients with depression who received chlorpromazine? The unexpected findings in 45 patients with depression (of 1,523 cases treated with chlorpromazine), that 15 (33.3%) were discharged and 22 (48%) improved, were deemed of sufficient interest to report, particularly since most investigators (including the undersigned) have felt that chlorpromazine was ineffective in this disorder.

It is difficult to believe that these results could have been achieved with "placebos" or lack of treatment. The latter frequently leads to suicide, or a state of chronicity that becomes refractory to further therapy. Spontaneous remission of a depression with psychosis may and does occur. If the duration of treatment of our discharged patients had been short, or if the depression had been associated with benign rapidly recovering disorders (psychosis due to alcohol), one could say that time was the therapeutic agent. The contrary was true. Two patients were treated 30 days or less, 4 from 1 to 2 months, 3 from 2 to 3 months, 2 from 3 to 4 months, and 4 from 5 to 11 months. The long hospitalization of some patients was indicative of the gravity of their illness. Previous ECT in some had produced only a slight improvement or was without effect. After 5 years of hospitalization, there is only a very remote possibility of improvement without treatment. Yet, 8 of our 10 patients, ill 5 years or more, were improved with chlorpromazine. Some psychotic symptoms still remained, although the depression had lifted. We are at present analyzing the failures with drug treatment. This material will be reported later.

I agree that electroconvulsive treatment is effective in the treatment of depression with agitation; chemotherapy is much simpler to administer and does not produce confusion or amnesia. Psychotherapy can be given concomitantly.

The unparalleled results obtained with chlorpromazine and Rauwolfia in most state hospitals have not been held by us or others to be applicable to office practice. Dr. Gahagan was able to observe these changes at Manhattan State Hospital, yet wrote of "the state hospital fanfare" (February 1956).

We have simply reported the facts as they appeared in the data sheets.

HERMAN C. B. DENBER, M. D.,
Director of Psychiatric Research,
Manhattan State Hospital.

PUBLICITY

Editor, THE AMERICAN JOURNAL OF PSYCHIATRY:

SIR: The A.P.A. Mail Pouch has brought a statement from the Committees on Research, Therapy, and Public Information deploring the publicity given to tranquilizing drugs. But why stop there? Other forms of psychiatric treatment are ballyhooed in just as undesirable a manner. "Subtle pressures . . . the eagerness of the public for 'good news' . . . foster popular stories based on optimistic reports" not only of drugs but of psychotherapy, group therapy, day centers, night centers, hypnotism, insulin, and every other kind of treatment. Many of us have been distressed for years by this publicity, indulged in more by those who should lead our profession than by the rank and file. It hardly needs a psychiatric training to recognize that behind the advertisement lie insecurity and inadequacy. Where we have effective treatments we do not have to advertise them.

The assumption behind this sham of self-advertisement masquerading as public education is that "anything goes" provided it

serves "The Cause," that the world is so sunk in its prejudices and resistances and we have such an urgent and world-reforming message that a type of publicity is permissible that is unthinkable in any other branch of medicine.

The men we have to convince about our methods are our medical colleagues, and on the whole they remain unconvinced, perhaps because of their scientific training and their contact with their patients over long periods. The attempt to appeal over their heads to the public may seem attractive to some, but is, in the long run, unwise.

You may say that this type of "public relations," though often unedifying and shameful, does no harm. But is it not harmful to add to the public's confusion, to divert funds and interest from areas where they are desperately needed, and to bring an honorable specialty into disrepute with the rest of the profession?

It is really very simple. Physicians should not advertise—themselves, their methods, or their institutions.

ELLIOTT EMANUEL, M. D.,
Dorval, Que.

EPHEBIATRICS

The division of medicine for specialist study may be vertical or horizontal. Vertical division takes for study and practice one organ, such as the heart or eye, one system, such as the genito-urinary, locomotor, or central nervous system; one tissue, such as the skin; or one disease, such as tuberculosis or syphilis.

The horizontal sections of medical practice hitherto selected for special study are two only,—the diseases of childhood, pediatrics, and the diseases of old age, geriatrics.

The diseases and injuries of youth present an equally important problem because of their rarity [sic], because of their special features, and because of the importance of their early recognition and effective treatment. They constitute a further subject for special study, a specialty that I have called Ephebiatrics (*Lancet* 1954, *267*, 395). The Ephebos was an Athenian youth who, at the age of 18, was called up for a period of military service. The name was applied also to those attending the gymnasia and the academies of the philosophers, what we should now call undergraduates. Ephebiatrics is the study of the ailments of Epheboi, of young people liable to serve in the armed forces, that is, between the ages of 18 and 25.

—SIR HENEAGE OGILVIE, K. B. E., F. R. C. S.

PRESIDENT'S PAGE

There is little question but that the curricula of U.S. medical schools, at present under careful scrutiny, will undergo marked changes in the next decade. It is probable also that, with these changes, psychiatry will be called upon to play a much greater role both in medical education and in practice. This likelihood is almost inevitable because of the nature and trends to modern medical practice and the fact that psychiatry has so much that is valuable of offer. It is important, therefore, that psychiatry be prepared for its expanded role and not be found wanting.

Difficulties of communication still seem to be the main stumbling block against a much broader acceptance of this discipline. Our colleagues still complain of inability to understand our presentations and, while admittedly some of the difficulty is "in the hearer," our task is to give as little justification for complaint as possible.

In general, the writings of psychiatrists compare quite favorably with those of specialists in other fields, aided often by the innate "human interest" of their material. There are fashions in writing and public speaking, however, and presently the idea seems to have gained credence that, to be scientific, all papers must conform to a pattern and be dull, weighty, and involved. It is a pity that residency training programs are so crowded that they cannot give time to the arts of writing scientific papers and of their presentation at meetings.

Admittedly, the important work of learning to write readable prose should have been accomplished in our high schools and colleges, but the fact remains that often it was not. Premedical students, for example, were overloaded with science courses, most of which were repeated in preclinical medical school years. A portion of this time in college might have been spent in acquiring a liberal education.

Sir Benjamin Ward Richardson, commenting upon Morgagni's *De Sedibus,* compared it with the masterpieces of world literature. He saw it as a relief from the usual repetition of old ideas told in hackneyed terms, and found it a refreshing set of descriptions "from nature's treasury." It is only given to a few writers to reach these heights, but it is probable that most of us can learn to avoid the pitfalls, the hackneyed terms, and the incessant repetitions.

The objection might arise here that psychiatric papers, like other scientific works, are written not as examples of "deathless prose" but, rather, to present scientific facts and concepts. The content, not the form, is important. Granted, this is true, but the fact remains that readability and scientific verity are not mutually antagonistic, and that writers who can avoid being dull, obscure, and prolix have much more likelihood of gaining attention. One of the great medical institutions of this country has met the problem part way. It insists that papers which emanate from it be literate and intelligible, that satistical tables be tabulated correctly, that x-rays really show what they purport to show, and, if slides are to be exhibited, that they be legible and uncrowded. This is a step in the right direction and psychiatric institutions that chose to emulate it would enhance their repuations and improve their lines of communication.

FRANCIS J. BRACELAND

The only liberty . . . . is a liberty connected with order; that not only exists along with order and virtue, but which cannot exist at all without them.

—EDMUND BURKE

COMMENT

PSYCHIATRY, PSYCHOLOGY, AND THE NEW YORK LAW

Two years ago, groups of psychologists and psychiatrists in New York State were embroiled in a vigorous public dispute. Statements issued to the press by psychiatrists and other medical men accused psychologists of seeking to practice medicine. In reply, psychologists, social workers, clergymen and others charged that psychiatry was seeking a kind of monopoly over a limitless domain, to the end that teachers and ministers, among others, would be denied many traditional functions.

The immediate cause of the conflict was a proposed amendment to the medical practice act in New York, which would have made diagnosis and treatment of mental conditions an exclusively medical function. Opponents charged that the definitions were too sweeping. The amendment was ultimately withdrawn by its sponsor. Another bill, which would have licensed psychologists to practice, also was withdrawn.

This year a bill providing certification for qualified psychologists became law in New York. It was supported by spokesmen for psychology and psychiatry. The state medical society was recorded as "not opposed."

Thus, on the legal front, interprofessional agreement was reached, in the state where, some months ago, it seemed most distant. Further, the New York law promises to serve as a model for other states.

The New York law does not codify fundamental accord between psychology and psychiatry on the numerous professional questions which have been at issue. It does not, for example, define the areas of practice for each and draw a boundary line between them. The law, like any true certification law, merely sets standards which a person must meet before he can say publicly, "I am a psychologist."

The law does not, specifically or by inference, sanction any kind of practice. Nor does it forbid any. A "disclaimer clause" declares that nothing in the law permits anyone to practice medicine as defined in the laws of the state—a declaration which leaves questions of practice exactly where they were before.

The Committee on Relations with Psychology has consistently held to the view that one profession should not meddle in the internal affairs of another. The Committee has advocated opposition to laws that would license psychologists, either because such laws—which must define an area of practice—contained definitions which invaded the area of medical practice or because the definitions were so general as to sanction almost anything. A certification law, however, merely confers on qualified psychologists the exclusive right to a title. In giving general approval to such laws, the Council and Executive Committee of The American Psychiatric Association have refrained from considering the standards of qualification, believing that psychologists should set the standards for their own profession.

Over the years that the Committee has been studying interprofessional relations, it has become amply evident that psychologists differ among themselves, as do psychiatrists, on what constitutes proper practice.

Few psychiatrists have expressed any desire to control the activities of psychologists in testing, market research, scientific research, personnel selection, teaching of psychology, and so on—activities in which many psychologists are engaged. The conflict has arisen only because some psychologists, in varying degrees, engage in psychotherapy.

A very few psychologists have asserted frankly that they consider themselves fully qualified as psychotherapists—perhaps better than most psychiatrists, and that they recognize no need for medical collaboration or supervision. In this group, a few assert that they are not responsible for their "clients" in a total sense, that the client who has a medical problem will and should seek out a physician just as he would if he had no relationship with the psychologist.

From this extreme, there is a spectrum of

beliefs. Many psychologists say that collaboration with a qualified physician is essential. Some accept patients only by referral from physicians. Some want and accept medical supervision—a term which can have a variety of meanings but definitely involves the physician's medical responsibility.

On the other side of the fence, a very few psychiatrists would like to exclude psychologists entirely from any contact with the mentally ill. A larger number want them in the picture, but limited to testing and research. Still others believe psychologists are useful as therapists in a medical setting under medical supervision. There are also a few psychiatrists who refer patients to psychologists for treatment, maintaining only nominal or no contact with the patient.

Probably a majority of psychiatrists subscribe to the principles of the joint statement issued by The American Psychiatric Association, American Psychoanalytic Association, and American Medical Association in 1954. ("Psychotherapy is a form of medical treatment and does not form the basis for a separate profession.")

Probably a majority of psychologists subscribe to the September 1955 resolution of their Association—which leaves the question open. Psychologists, generally, seem to believe that they are not ready either to assert definitively the boundaries of their profession or to accept boundaries fixed by other professions or by law.

The Committee on Relations with Psychology has consistently held to the position that interprofessional conflicts are inherently constructive, that the arena of interprofessional debate has been the source of much progress. This is especially true of professions such as psychology and psychiatry which have both been concerned with mental illness, the first because of its potential contribution to research, the second because of its primacy in practice, its traditional responsibility for the mentally ill, and the fundamental belief in the inseparability of "mind" and "body."

It is inappropriate and undignified, the Committee has said, for professions to ask legislators or the public at large to settle their disputes.

But what about the nonmedical psychotherapists, some of them psychologists, some with little or no professional training, who are, today, treating the mentally ill without medical supervision or collaboration? Is it not necessary, we are often asked, to seek strengthening amendments to state medical practice acts?

In some states, this would seem desirable, states where the acts define practice in terms limited to organic illness and physical methods of treatment. But, in fact, there are few such states. And the hard fact is that in many states where the medical practice acts specifically encompass diagnosis and treatment of mental illness, there have been virtually no cases where nonmedical psychotherapists have been prosecuted or even deterred.

Passing a law doesn't mean that it can or will be enforced. It may have a deterrent effect on a few, but not on those whose activities are most dangerous. A moment's reflection will suggest why it is so difficult to assemble legal evidence against a nonmedical psychotherapist. The transaction between him and his "client" is private and verbal. If the "client" indeed is mentally ill, his testimony may not be impressive. And it is not enough to prove that a mentally ill person was closeted with a person—who may call himself a "psychological advisor" or any of a dozen other titles; it must be shown that an attempt was made to treat the illness.

The medical profession as a whole has succeeded in prosecuting flagrant quacks, who were seldom seriously hurt by the small fines imposed. But, generally speaking, medicine has established its position by public understanding. The vast majority of people go to doctors because they have confidence in them; they do not go to quacks.

So the Committee on Relations with Psychology believes that vigilance is wise and sound medical practice acts desirable. But these will not eliminate the quacks, nor will prosecution of reputable psychologists.

From recent legislative experiences in a number of states, we have learned that legislators have no desire to become involved in a dispute between reputable professions. It

is almost, but not quite, unthinkable that a bill supported by one of the professions could be passed over the opposition of the other.

For all of these reasons, we welcome the New York law. It will give psychologists legal recognition of their professional status. It does not settle the question of who may do what, but that question will not soon be settled by law.

In 1957, 44 state legislatures will meet. In at least 16 of those states psychologists have expressed some desire for legal recognition. The New York law, the first of its kind to be enacted, offers a promising basis for interprofessional accord.

For some time legislative matters have preoccupied members of both professions concerned with interprofessional relations. We hope that it will now be possible to turn our attention to the question of substance: How can medicine and psychology best work together for the welfare of the public?

PAUL E. HUSTON, M. D.,
Iowa City, Ia.
JOHN PERRY,
Washington, D. C.

OLD AGE

Socrates questions the aged Cephalus.—Is life harder towards the end, or what report do you give of it?

I will tell you, Socrates, he said, what my own feeling is. Men of my age flock together; we are birds of a feather, as the old proverb says,—and at our meetings the tale of my acquaintance commonly is—I cannot eat, I cannot drink; the pleasures of youth and love are fled away: there was a good time once, but now that is gone, and life is no longer life. Some complain of the slights which are put upon them by relations, and they will tell you sadly of how many evils their old age is the cause. But to me, Socrates, these complainers seem to blame that which is not really in fault. For if old age were the cause, I too being old, and every other old man, would have felt as they do. But this is not my own experience, nor that of others whom I have known. How well I remember the aged poet Sophocles, when in answer to the question, How does love suit with age, Sophocles,—are you still the man you were? Peace, he replied; most gladly have I escaped the thing of which you speak; I feel as if I had escaped from a mad and furious master. His words have often occurred to my mind since, and they seem as good to me now as at the time when he uttered them. For certainly old age has a great sense of calm and freedom; when the passions relax their hold, then, as Sophocles says, we are freed from the grasp not of one mad master only, but of many. The truth is, Socrates, that these regrets, and also the complaints about relations, are to be attributed to the same cause, which is not old age, but men's characters and tempers; for he who is of a calm and happy nature will hardly feel the pressure of age, but to him who is of an opposite disposition youth and age are equally a burden.

—PLATO
(*The Republic*. Book I,
Jowett translation)

NEWS AND NOTES

Dr. Bowman's Retirement.—On June 30, 1956, Dr. Karl M. Bowman retired as chairman of the department of psychiatry at the University of California School of Medicine, and superintendent and medical director of The Langley Porter Clinic, California Department of Mental Hygiene. Prior to his retirement, the staff of The Langley Porter Clinic held a reception for him which was attended by 400 of his friends, former students and colleagues, and following this the faculty of the department of psychiatry held another reception to honor him.

Dr. Bowman has had a long and illustrious career. After graduation from the University of California School of Medicine in 1913, he worked at Bloomingdale Hospital, New York, and the New York Neurological Hospital, and from 1921 to 1936 was chief medical officer at the Boston Psychopathic Hospital under Macfie Campbell. During those years he taught at the Boston University College of Medicine, at Harvard Medical School, at Simmons College School of Social Work, and the Smith College School of Social Work, and carried out many research studies. In 1936 he assumed the directorship of the division of psychiatry at Bellevue Hospital, New York, and during this period his many fundamental investigations in the fields of alcoholism and shock therapy were undertaken. He was professor of psychiatry at the New York University College of Medicine, where he remained until his appointment as the medical superintendent of The Langley Porter Clinic and the chairman of the department of psychiatry at the University of California School of Medicine in 1941. His broad vision and indefatigable efforts helped to develop The Langley Porter Clinic into one of the first-class psychiatric institutions in the country. Under his direction and inspiration teaching and research programs flourished.

Dr. Bowman has held many important posts during his very active professional career. It is his unique distinction to have been president of The American Psychiatric Association for two years, from 1944-1946. He has been a director of the American Board of Psychiatry and Neurology, a member of the editorial boards of several journals, including The American Journal of Psychiatry, and continues to be a consultant to the Surgeon General of the United States Army, Navy and Air Force, as well as an area consultant in psychiatry to the Veterans Administration. In 1947 he was sent as a representative of the World Health Organization of the United Nations to assist in setting up the National Neuropsychiatric Institute in Nanking. In July 1950 he made a tour of the Far East Command at the request of the Surgeon General of the Army, as a special consultant in psychiatry, and from October 1954 to April 1955, under the sponsorship of the China Medical Board of New York, Inc., he taught at the University of the Philippines and at the Unigersity of Indonesia at Djakarta. While at the University of the Philippines Dr. Bowman was made an Honorary Fellow of the College of Physicians of the Philippines, and, "in recognition of his distinguished services for the promotion of the cause of mental health in the Philippines," was made an Honorary Life Member of the Philippine Mental Health Association. He was also awarded the degree of Doctor of Science (Honorary) by Washburn College, Topeka, Kansas, on May 30, 1953. At the present time he is an active, working member of the Northern California Citizens' Advisory Committee to the Attorney General on Crime Prevention. His record of public service on a national, state, and local level has been outstanding. His frank and straight forward presentation of facts has brought distinction to the practice of psychiatry.

Dr. Bowman's research work has covered many areas, in particular the fields of schizophrenia, alcoholism, geriatrics, and sexual problems. Upon his so-called retirement he will continue teaching half-time at the University of California School of Medicine and his research in the fields of alcoholism and geriatrics, as well as compiling the material collected during the several years of the sex research project directed by him. His "re-

tirement" will indeed be an active one and his friends and colleagues are looking forward to his continued professional guidance and encouragement.

ALEXANDER SIMON, M. D.

THE NATIONAL LIBRARY OF MEDICINE.—President Eisenhower, on August 3, signed a bill establishing a National Library of Medicine in the Public Health Service and transferring to the Service all of the functions of the Armed Forces Medical Library (See the June issue of this Journal, p. 1032). A Board of Regents for the administration of the Library will consist of 7 *ex officio* members—the Surgeons General of the Public Health Service, the Army, Navy, and Air Force, the Chief Medical Director of the Department of Medicine and Surgery of the Veterans Administration, the Assistant Director for Biological and Medical Sciences of the National Science Foundation, and the Librarian of Congress, together with 10 additional members appointed by the President with the consent of the Senate. The appointive members will serve 4 years.

A site for the new institution will be selected by the Surgeon General of the Public Health Service after consultation with the Board of Regents.

84TH CONGRESS APPROPRIATES RECORD SUM FOR MENTAL HEALTH.—The 84th Congress voted over $35,000,000 to the National Institute of Mental Health for the coming year, as well as large sums to match state monies for the construction and research laboratories in the psychiatric field, and $12,500,000 for the construction and maintenance over a decade of a mental hospital in Alaska.

The breakdown of the N.I.M.H. appropriation is as follows: over $12,000,000 for training grants and scholarships; $10,000,000 in research grants; and $6,000,000 in matching grants for community clinics and preventive services; $2,000,000 will be devoted to a nationwide evaluation of the new tranquilizing drugs, a project for which a permanent staff is now being recruited.

Apart from the monies voted to the N.I.M.H., the 84th Congress also: authorized appropriation of $90,000,000 to be spent over the next 3 years for the construction of research laboratories, $18,000,000 of which will go to psychiatric research construction; voted $1,500,000 for a program of federal grants to support pilot projects in new ways of handling the mentally ill; voted $2,400,000 to retarded children's programs; and finally, voted $500,000 for the continuing support of the Joint Commission on Mental Illness and Health.

One of the most important acts of the 84th Congress in the general health field was the passing of the Hill-Kennedy Bill authorizing the establishment of the National Library of Medicine (see Comment, *American Journal of Psychiatry*, July, 1956). The success of this legislation is owing largely to the persistent efforts of Dr. Alan Gregg, vice-president of the Rockefeller Foundation, and American medicine will be profoundly grateful to the 84th Congress for thus assuring that the National Library of Medicine will become a reality.

SAFE DOSAGE LEVELS IN RESERPINE.—Dr. Ralph G. Smith, Chief of the New-Drug Branch of the Bureau of Medicine, U. S. Department of Health, Education and Welfare, in a letter to all pharmaceutical firms producing new-drug preparations containing reserpine, asks that, in the labeling of these compounds, a lower safe dosage level be recommended and that additional warning statements regarding contraindications and potential hazards be incorporated into their literature to physicians.

In the treatment of hypertension, or of anxiety states on an outpatient basis, the present consensus is that the usual recommended maintenance dose should be 0.25 mg. daily. While doses of up to 1.0 mg. daily may safely be recommended for the initiation of therapy, they usually should not be continued for longer than a week. An occasional patient may require up to 0.5 mg. daily as a maintenance dose, but if adequate response is not obtained from this dosage, it is well to consider adding another hypotensive agent rather than increase the dose of reserpine.

Continued use of reserpine in doses of 0.32 mg. daily has been shown to increase gastric secretion and gastric acidity in a significant number of cases, whereas doses of 0.25 mg.

have not been shown to do so. Doses of 0.5 mg. daily for as short a time as 2 weeks produced this effect in most individuals tested and have resulted in massive gastro-intestinal hemorrage or perforation of an ulcer. More important, reserpine in daily doses of 0.5 or 1.0 mg. produces severe depression in a significant number of cases, and has precipitated a good many suicide attempts, some of them successful. Many of these depressions have been severe enough to necessitate long-term hospitalization. Therefore reserpine in daily doses above 0.25 mg. is contraindicated and in lower doses should be used with caution in patients with a history of mental depression, peptic ulcer, or ulcerative colitis. Specific caution is necessary with respect to depression, and physicians should follow carefully their patients who are on reserpine or other Rauwolfia preparations.

There is no general agreement as to the safety of dosages higher than 5 mg. daily, for institutionalized psychotic patients, and the usual maintenance dose should probably be stated as 2.0 mg. daily. Reserpine should be discontinued for 1 week before instituting shock therapy, since it may result in increased severity of convulsions, respiratory difficulty, and other complications. The possible dangers of hypotension and fluid retention should be borne in mind when large doses are used in debilitated patients or those with cardiac disease.

Tablets of 0.1, 0.25, or 0.5 mg. are suitable for the treatment of hypotension and mild anxiety states. Tablets of 0.75 mg. or higher are suitable only for treatment of hospitalized psychiatric patients under carefully controlled conditions. The declaration of strength on the label of these drugs, Dr. Smith cautions, should stand out prominently from the rest of the label; and on tablets of 0.75 mg. or more, should state "for neuropsychiatric use only."

Plight of Hungarian Doctors.—The World Medical Association has called attention to the dire plight of professional people in Hungary, who, prior to the current government regime, elected private practice rather than government employment as a means of earning their living. A typical case is that of an 83-year-old doctor who put his savings, earned through free enterprise, into an apartment building and insurance in U.S. currency. Both these investments have been "nationalized" by the current regime, with no compensation to the doctor who, with his 74-year-old wife, lives in one room on fare provided by the local poor house (one meal a day consisting of soup and one vegetable).

The World Medical Association in and by itself is powerless to bring pressure to bear on the Hungarian government to alleviate such conditions. However it hopes that medical associations in the U. S. will be sufficiently moved to instigate their government to act through the United Nations to make the Hungarian government cease its gross violation of the International Covenant on Human Rights.

Volunteer Services in Mental Hospitals.—A program to increase volunteer services in the hospitals of New York State was inaugurated last August with the appointment of a statewide director of volunteers, Commissioner Paul H. Hoch has announced.

Barbara Griffiths, former director of volunteers at Hudson River State Hospital, has assumed the new post and will aid the department of mental hygiene in organizing volunteer services in each of its 21 institutions.

The effect of a volunteer program on hospital-community relationships already has been successfully proved in the experimental project at the Hudson River State Hospital. The expanded volunteer program is being initiated under a grant obtained from the Doris Duke Foundation, New York City, by the New York State Society for Mental Health.

Rehabilitation in Infantile Paralysis.—The National Foundation for Infantile Paralysis has made a grant of $78,553 to the National League for Nursing to support the NLN's efforts to improve nursing care for patients with polio and other diseases which lead to a need for rehabilitation.

Dr. Eugene Davidoff.—The death of Dr. Davidoff, at the age of 55, occurred at Ellis Hospital, Schenectady, New York, where he had been in charge of the psychiatric service since 1949.

Dr. Davidoff received his A. B. degree from Columbia, and M. D. from the University of Iowa College of Medicine in 1927. He went at once into the N. Y. State mental hospital service and had a widely varied experience at several centers. From 1937 to 1942 he was assistant professor of psychiatry at Syracuse University. During World War II he was on duty at Fort Leonard Wood in Missouri as consultant in mental hygiene with rank of Lieutenant Colonel. He contributed frequently to the psychiatric literature, and wrote chapters in *Failures in Treatment* edited by Hoch, and in *Mental Disease in Later Life* edited by Kaplan. He was a Diplomate of the American Board of Psychiatry and Neurology and had been a Fellow of The American Psychiatric Association since 1934.

Dr. Wolfson Director of Letchworth Village.—Commissioner Paul Hoch has appointed Dr. Isaac N. Wolfson senior director of Letchworth Village at Thiells, N. Y., to succeed Dr. Harry C. Storrs, who retired June 30, 1956. Dr. Wolfson, director of Newark State School since 1950, took over the new post September 1.

Dr. Wolfson has been in state service for 25 years, and before assuming the post at Newark State School he had been assistant director of Manhattan State Hospital.

Expert Committee on Psychiatric Nursing.—The World Health Organization has published the first report of the Expert Committee on Psychiatric Nursing. The report traces the various stages of psychiatric care from the confinement of the patient to his reestablishment in the community, and emphasizes the role the psychiatric nurse plays throughout. Current trends depict her role as less custodial than in the past and more therapeutic. One section of the pamphlet deals with the education of psychiatric nursing personnel, the shortage of which today has led to a near-crisis in some state hospitals.

Copies of the report may be obtained from World Health Organization, Palais Des Nations, Geneva, Switzerland, for 30 cents each.

Research Relating to Children.—This twice-yearly publication of the Department of Health, Education, and Welfare is now soliciting reports of research on programs and services for children in the health and welfare fields. Only those studies of physical health which are of interest to investigators in fields other than the strictly medical sciences, e.g. studies on physical growth, psychosomatic illness, emotional or social factors in health and disease, will be accepted.

Copies of *Research Relating to Children* may be purchased through the Government Printing Office at whatever price covers the cost of printing the individual issue. The present issue is 60 cents. Inquiries and reports of research should be directed to the Clearinghouse for Research in Child Life, Children's Bureau, Social Security Administration, U.S. Department of Health, Education, and Welfare, Washington 25, D.C.

American Electroencephalographic Society.—At the 10th annual meeting of the American Electroencephalographic Society held in Atlantic City, June 15-17, 1956, the following were elected to office: president, Dr. John R. Knott, Iowa City, Iowa; president-elect, Dr. Robert S. Dow, Portland, Oregon; secretary, Dr. J. K. Merlis, Boston, Massachusetts; treasurer, Dr. Peter Kellaway, Houston, Texas.

Correction.—In a note on Egyptian Medicine in the August Journal, p. 183, Etaoin Shrdlu was at work on the Greek words. The two Greek words, from which the word psychiatry may have been derived, correctly spelt are: *ψυχῆς ἰατρεῖον*. The quotation was from *A History of Medicine*, by Henry E. Sigerist.

In the same issue of the Journal, p. 185, by an inadvertent slip in transcribing a news item, the Washington University School of Medicine located in St. Louis, was transported to Chicago. We regret this error; Washington University still remains in St. Louis.

Connecticut Seminar in Psychiatry and Neurology.—The 10th postgraduate

seminar in psychiatry and neurology extends from September 1956 to May 1957. It is sponsored by the Department of Mental Health of the State of Connecticut and the Department of Mental Health of Yale University, in cooperation with various hospitals and institutions in the State.

This is a comprehensive course covering all aspects of clinical neurology, neuro-anatomy, neurophysiology, neuropathology, clinical psychology, basic psychiatry, child psychiatry, and related subjects.

There are no fees for any of the courses. For copies of the program, apply to the Office of the Assistant Dean, Yale University School of Medicine, New Haven, Connecticut.

Music Therapy.—The seventh annual conference of the National Association for Music Therapy will be held at the Hotel Jayhawk, Topeka, Kansas, October 18-20, 1956. Members of allied professions may attend by paying a registration of 5 dollars. For further information, write to Margaret Sears, Chairman, Publicity Committee, Topeka State Hospital, Topeka, Kansas.

In one of his well-known addresses, Wilfred Trotter, that sage, philosopher, and surgeon, discussed the relative roles of reason and observation in medicine, and stressed the necessity of a due mixture of both and the evils of either when not balanced by its natural complement. Today, perhaps, observation is in the saddle, but not always with both its feet in the stirrups of reason, and the frequent and misguided reiteration of John Hunter's famous question to the young Jenner, "Why think, why not try the experiment?" that we encounter in Hunterian addresses and articles on medical history, has become a foolish and tiresome cliché. We cannot think that Hunter wished to imply an antithesis between these two activities, yet some of the platitudinous quoters of his historic remark write as though they believed that to make an experiment would relieve Jenner from the obligation of thinking: from the iron necessity of sound intellectual method. Perhaps Harvey's brief comment upon his own labours, that they were the fruit of "reason and experiment," though now forgotten by us, was an aphorism far better worth preserving. The curious will note which of these pronouncements came from the physician and which from the surgeon, recalling that the latter did not enjoy for some centuries that close relation with the university which from the beginning was the advantage of the physician.

—Sir Francis Walshe
(The First Arthur Hall Memorial Lecture, University of Sheffield, March 22, 1956)

BOOK REVIEWS

THE SUBNORMAL MIND. THIRD EDITION. By *Sir Cyril Burt, D.Sc., Hon. Litt. D., Hon. LL.D.* (New York: Oxford University Press, 1955. $5.00.)

This is a third edition of the book first published in 1935, and is similar to the previous editions except for the addition of very brief notes at the end of each chapter and of a new appendix.

The first edition consisted of a series of lectures given under the terms of Mr. Charles Heath Clark's bequest to the University of London, which were slightly expanded and revised for publication. Since the first edition was published, the author has observed that the interest in clinical psychology, particularly as applied to school children, has rapidly expanded and attracted increased public interest. In preparing this edition the author has tried to make it useful to the general practitioner as well as to all others who are interested in the welfare of the child, such as teachers, educational officials, clinical psychologists, and others.

In the first chapter, "The Normal Mind," he describes his concept of the normal mind and the methods available for investigating the more normal characteristics. He observes that "most forms of mental subnormality turn out to be little else than exaggerated deviations in one or more of these characteristics. Certain symptoms and certain disorders are definitely pathological, and are found only in the mentally diseased; but these are comparatively rare." He then takes up in turn the various forms of mental subnormality—those that affect the intellectual aspect of the mind followed by the moral and temperamental disorders. These are presented in turn by chapters on the mentally deficient, the dull or backward, the delinquent, the neurotic, and by a chapter in which he describes what he terms the "asthenic" and another on the "sthenic neuroses." There follows a chapter entitled "Ascertainment and Incidence," in which he first considers how far systematic observation and experimental methods will carry us in the diagnoses of psychoneurotic disturbances and then discusses the frequency of neurotic conditions among adults.

The section on mental deficiency and the definition of the defective seem quite adequate for presentation to general practitioners though there is too little said about the social and behavioral consequences of this defect. Much of the book deals with the British social scene, particularly the educational system, and derives the bulk of its material from British workers. Burt does recognize, however, that the importance of heredity and rare types of disease processes has been overemphasized in mental deficiency. The material on psychological tests and on the concept of mental age and intelligence quotient is good.

We all can join Burt in the hope he expresses in his concluding sentence of the preface, "May I hope that one outcome of this book will be to stimulate research on what are some of the most important problems of the day?"

E. J. ENGBERG, M. D.,
Minnesota School and Colony.

INTERPRETATION OF SCHIZOPHRENIA. By *Silvano Arieti, M.D.* (New York: Robert Brunner, 1955. $6.75.)

In this monumental volume Dr. Arieti accepts the challenge that schizophrenia has long constituted for students of psychological illness. He makes an inspired and penetrating attempt to understand and reveal the processes underlying this mysterious and perplexing mental phenomenon.

The work is unusually broad in its scope. The author obviously has drawn on extensive clinical experience and exhaustive familiarity with the literature as a basis for painstaking reflection. Appropriately, the reader is immediately oriented by a review of the historical development of the concepts of schizophrenia. Kraepelin, Bleuler, Meyer, Freud, Jung, and Sullivan are designated as the principal contributors with a critique of the contribution of each. It is evident that the author is strongly influenced by Sullivan's interpersonal theories.

In "The Psychodynamics of Schizophrenia," the etiological basis of the process is traced through the anxiety producing interpersonal relations in early childhood to general primary defenses, which Dr. Arieti names the schizoid personality and the stormy personality. In his opinion these primary defenses are so inadequate for dealing with the increasing complications of later life that the individual may have to turn eventually to the psychotic solution. The elements of the psychotic solution are presented in, "The Psychological Structure of Schizophrenia." These Dr. Arieti calls the formal mechanisms. They are mechanisms, which are common to both the normal and the neurotic individual, and represent evolutionary psychological development steps by which ancient primitive man gradually became the man of today. These processes are considered to become teleologically available for regression when the individual finds his personality intergration inadequate to meet the overwhelming anxiety produced by current living.

This principle of teleologic regression with a return to archaic form of rationality or paleologic thinking is undoubtedly one of the most stimulating and thought-provoking parts of the book. The author enlarges on this concept under the headings, "The Retreat of Reason," "The Retreat from Society," and "The Retreat from Emotions."

Dr. Arieti believes that although schizophrenia has been studied rather thoroughly from the descriptive point of view very little has been done to

elucidate the details of its regression phase. He undertakes this in a section called, "The Longitudinal View of Schizophrenia." He divides this phenomenon into an initial stage, an advanced stage, a pre-terminal stage, and a terminal stage. In each stage he finds strong corroboratory proof for his theory of teleological regression. He illustrates how the archaic mechanisms as they are utilized prove inadequate for adaptation and result in the schizophrenic seeking constantly more archaic mechanisms, and thereby, ever continuing to a lower level of adjustment.

In "The Psychosomatic Aspect of Schizophrenia," the author reviews the literature regarding somatic changes in the illness. He concludes this discussion with some most intriguing speculations in regard to the part that the central nervous system and the autonomic nervous systems may play in the phenomenon of teleological regression.

The final section deals with treatment of schizophrenia. While Dr. Arieti is prejudiced in favor of psychotherapeutic methods in dealing with the illness, and regards the somatic therapies as simply symptomatic treatment, he finds, nevertheless, that the latter are useful, and advocates that they be used for whatever they are worth. Regarding psychotherapy he thinks that one of the most important considerations is that the patient must feel a benevolent, sincere effort is being made to reach him, with no demand being made on him. From this point of view it is evident, he believes, that the personality of the therapist is very important. He offers various suggestions in regard to the therapist-patient relationship, and points out the importance of the therapist's participating in the whole life of the patient.

This book is an extremely valuable one for the advanced student of psychiatry. It compactly assembles modern knowledge of schizophrenia, and, at the same time, introduces a number of tantalizing questions for investigation. This is a book that all workers interested in psychotic illness will want to make a part of their libraries.

WALTER L. GRAHAM, M. D.,
Henry Ford Hospital.

NEUROGLIA: MORPHOLOGY AND FUNCTION. Paul *Glees, M.A., D.Ph., M.D.*, (Springfield: Charles C. Thomas, 1955. $6.00.)

The author's historical introduction reminds us that the elucidation of the structure of astrocytes, oligodendroglia, and microglia cells is almost completely a product of the present century. Although Robertson, in Edinburgh, undoubtedly stained microglia, specifically, in 1900, it took him another 10 years to become convinced of their mesoblastic origin and to christen them "mesoglia." Hortega rediscovered these cells, by silver staining, in 1921, and in the same classical paper he first described and named oligodendroglia.

It is, therefore, very valuable that Professor Glees should have written this good summary of our knowledge of the neuroglia to date. The magnitude of his task is shown by his bibliography of nearly 300 references.

The known special functions of the different neuroglial cells are conservatively and well discussed, and speculations for future research are hazarded.

This is a very satisfactory little book to have handy for all who are interested in the structure and functions of the nervous system.

ERIC A. LINELL, M. D.,
Toronto, Canada.

CURRENT THERAPY—1956. Edited by *Howard F. Conn, M.D.* (Philadelphia and London: Saunders, 1956. $11.00.)

This latest volume follows the characteristics of its predecessors, but is not as bulky, being about 200 pages smaller. It has been shortened by not having as many articles duplicated by various authors, and by smaller type in places. There are a large number of new contributors and those who own the previous volumes will thus have available a large experience as well as improvements in treatment over the years.

There are many new subjects covered. Among these are: a new survey of the drugs for hypertension; the tranquilizing drugs in some mental diseases; the problem of poliomyelitis vaccination and schedules for immunization to common infectious diseases.

In a reference book of this sort there may be a tendency to take for granted that the reader knows already the details of dosage of even common drugs, but this should be avoided unless a clear reference, with the page, is given.

Where younger physicians contribute, the tendency to make a list of treatment procedures, rather than a description of the therapeutic measures and the reason for them, should be avoided where possible.

The index is good and the listing of the new pharmaceutical names with their ingredients is an excellent feature. The publishing is excellent.

TREVOR OWEN, M. D.,
Toronto, Canada.

THE MEDICAL TREATMENT OF MENTAL DISEASE. By *D. J. McCarthy, M.D., and K. M. Corrin, M.D.* (Philadelphia: Lippincott, 1955. $12.00.)

The book is noteworthy because of the vividness, accuracy and completeness of the descriptions of various clinical syndromes, as for example alcoholism, psychopathic personality, and the adolescent psychoses. It is timely because of the attention given to the art of the practice of medicine resulting in practical guidance which I find unequaled elsewhere.

Beginning with Weir Mitchell whose pupil he was, Dr. McCarthy early developed an intense interest in the art of the practice of medicine as applied to nervous and mental diseases. This gives the book its unique flavor; it comes as close as can be to handing down to young doctors or those

unfamiliar with the care of the mentally ill, the necessary skill in applying knowledge and ability to their every-day care.

The book is drawn from experiences beginning in times when far fewer therapeutic weapons were available, when the physician had to rely more on diagnostic acumen, and spent much more time understanding the patient and the factors in his environment responsible for the development or distortion of his personality. To him "total push" included altering and strengthening the patient's purpose, devising ways and means of improving his physical health (such as regimens to insure constancy of cooperation and guidance) and inspiration in helping him to acquire new interests. It also included knowing and influencing those about the patient, and understanding the benign and pernicious forces responsible for his health or disease. Reading the case histories and therapeutic discussions of these factors will inspire admiration for the authors' wisdom, and for their energy and determination in using every single force available for recovery.

The advances in the more technical and physical fields of medicine are much more likely to become a part of permanent knowledge than the advances in the art, accumulated by keen observation over long years of general practice. All of us know many wise and able physicians whose wisdom and experience are lost to their successors, because of their neglect or inability to write in this most difficult area.

WILLIAM L. LONG, M. D.,
Philadelphia, Pa.

STRESS. Fifth Annual Report, 1955-56. Edited by *Hans Selye, M. D., and Gunnar Heuser, M. D.* (New York: M. D. Publications, 1956. $20.00.)

This is the fifth of the annual reports which represent supplements to the book *Stress* published in 1950. The extensive bibliography and cross-referenced system of indexing, according to subject, has been continued. This bibliography covers most of the world's literature in the broad field of interest encompassed by the book. The *Annual Reports* plus the original *Stress* thus make a unique source of reference material for the period 1950-55.

The series of special articles by authorities such as Jerome Conn, Dwight Ingle, Thomas Dougherty, Ernst Scharrer, Herbert Stoeck, include "Primary Aldosteronism—A new Clinical Entity"; "Hormonal Influences on Inflammation and Detoxification"; "The Role of the Adrenal Cortex in the Etiology of Disease"; "Neurosecretion." These articles contribute very greatly to the balance and value of the book, presenting as they do divergent views on stress and allied topics. For those who already own earlier volumes of the series, the book is highly recommended.

E. A. SELLERS, M. D.,
Defence Research Medical Laboratories,
Toronto, Canada.

THE CONCEPT OF SCHIZOPHRENIA. By *W. F. McAuley*. New York: Philosophical Library, 1954. $3.75.)

Schizophrenia is a complex disorder which has constituted one of the most challenging problems for research during the past 50 years. To date it has apparently eluded any verifiable knowledge as to its cause or causes, but some of the investigations have revealed considerable information regarding the expressions, the diagnosis, the course and the outcome of the disorder, although there is a rather wide divergence of opinions concerning the interpretation of even these findings and their practical applications.

This book attempts to estimate and evaluate the concepts and opinions that have accumulated on schizophrenia including the historical background and the modern attitudes. The eternal pseudo-question of the relative importance of heredity and environment comes in for discussion.

The first chapter presents the "scientific recognition of schizophrenia" with due consideration of the high points and of the contributors from Plato to Cannon, Kretschmer, and Sheldon. One finds a quotation from Kraepelin that is seldom mentioned anywhere these days. Kraepelin concluded "that we must seek the real cause of dementia precox in conditions which are spread all over the world, which thus do not lie either in race or in climate, in food or in any other general circumstances of life." In short, the disorder is similar in framework wherever it is found.

The second chapter offers a survey of dynamic concepts of schizophrenia including Adolf Meyer's reaction types and the experimental approaches with drugs. Chapter 3 is devoted to heredity with a discussion of the literature revealing the usual pro-and-con attitudes toward the role of heredity. Here we find the same old sloppy diagnostic work and the substitution of wishes for facts—the "hard" facts of heredity. Apparently many opposed to accepting hereditary factors as being operative in man accept it willingly when applied to animals. Chapter 4 in discussing the impingement of social and environmental conditions upon the personality fails to present verifiable evidence that the environment is particularly important in causing schizophrenia. Obviously what is "stress" to one person is not to another, regardless of the age of the individual.

Chapter 5 describes a portion of the work being done in neurophysiology and metabolism, and the remainder of the book is concerned with diagnosis and a survey of modern therapy. According to the author "Although the psychogenic origin of schizophrenia has been stressed throughout this book it must not be forgotten that organic components sometimes accompany the disorder and modify the diagnosis." Some might want to express this relationship differently since it is possible on the same evidence offered to assume that only the secondary symptoms of the disorder are "psychogenic" in origin but that the primary ones originate elsewhere.

Although there is much in the book that cannot

be accepted, at least in the light of present scientific knowledge, it does reveal the dire need for a philosophy of research, a method, and for a consistent follow-up study to determine what happens in thousands of cases. It provides a brief survey of the present knowledge, and offers a useful bibliography on the subject. It can be read with interest and profit.

NOLAN D. C. LEWIS, M. D.,
Princeton, N. J.

STUDIES IN SCHIZOPHRENIA: A MULTIDISCIPLINARY APPROACH TO MIND-BRAIN RELATIONSHIPS. Reported by *Robert G. Heath, M. D.* (Cambridge: Harvard University Press for Commonwealth Fund, 1954. $8.50.)

Dr. Robert Heath and twenty-two collaborators, representing a number of research disciplines, report in detail the results from a study of the effects of stimulation and destruction of parts of the septal region of the animal and human brain. They attempt a multidisciplinary approach to some aspects of schizophrenia, with the techniques of psychiatry, clinical psychology, biochemistry, and neurophysiology.

The presentation begins with an introduction by Dr. Heath on the theoretical concepts, which postulates a possible relationship between patterns of thought and physiological processes in different levels of the nervous system and that the septal region is an area of major importance in the activating and inhibitory circuits.

The second section deals with acute and chronic animal experiments some of which indicate that lesions of the septal region initiate an Addisonian-like syndrome. Several changes of metabolic significance are described in detail. A large part of the book is included in section 3 which describes the experimental procedures with 20 schizophrenics to whom mild stimulation was applied with subcortical electrodes. This part represents a tremendous amount of careful work which has produced many interesting data obtained in physiological, biochemical, and psychological categories.

The next 2 sections are devoted to case reports on 25 patients with critical evaluations by a group of workers on the project. Section 5 presents brief interesting discussions by 10 distinguished scientists representing the areas studied, and finally section 6 brings out improvements in the techniques, discusses new experiments and shows a follow-up study to evaluate improvement in some of the cases treated.

It would seem that these workers have made a valuable beginning toward bringing into one focus the psychoanalytical, the biochemical and physiological aspects of the major mental disorder of our times. The text must be read for a comprehensive view since no brief review can convey the scope, detail, and significance of such research.

NOLAN D. C. LEWIS, M. D.,
Princeton, N. J.

PROGRESS IN CLINICAL PSYCHOLOGY. VOLUME II. Edited by *Daniel Brower and Lawrence E. Abt.* (New York: Grune & Stratton, 1956. $6.00.)

Since the publication of Volume I a number of years ago, clinical psychology has undergone tremendous changes, having widened its scope of research and clinical activities, and has come to a turning point where gains are being consolidated and an evaluation being attempted. In fact, it is this reviewer's impression that the tenor of almost all the contributors to this volume is directed toward consolidation and evaluation of "progress."

The volume is divided into five parts, the first consisting of but an introductory statement of one of the coeditors, Abt, a statement historical as well as empirical. Of the other four, it seems to this reviewer a slight of "progress" that the second part, "Assessment and Appraisal Processes," dealing primarily with Rorschach and TAT tests, contains but three contributions and constitutes in quantity the smallest of the whole volume. This reviewer has always been of the opinion that there was something more to psychology than testing and, particularly, research in the Rorschach methods, which, to the best of my knowledge, are overrated in this country, as compared with the Old World where the Rorschach originated.

The third and fourth parts seem to contain the meat of the progress made in clinical psychology—the psychotherapeutic, counseling, and special application processes, such as the various schools (psychoanalytic and Rogerian), tools (play, music, art, bibliotherapies, and the psychodrama), special disabilities (reading, speech disorders, cerebral damage, and the physically handicapped), special aspects and special items (hypnosis, research on dreams, statistics), and some of the settings, in which clinical psychology is practised (correctional and mental institutions). In view of the breadth of this volume, I would briefly like to review a few contributions.

One paper was written by Kogan on statistical methods in psychology, a subject one rarely finds in the medical or nonmedical literature of psychology. The author is a well-known social scientist and demonstrates how therapists can "borrow" constructively a method to be used by an allied discipline. A selected, but ample, bibliography is appended from which the interested reader may choose additional material if he desires to delve deeper into this subject.

The other paper to be singled out for comment here is George R. Bach's "Current Trends in Group Psychotherapy." In aim and scope as well as in length it is the longest of the entire volume, in research one of the most extensive (containing no less than 167 bibliographical references), and presenting a host of many theories in group psychotherapy. Bach, although admittedly favoring his school, the dynamicist school of Kurt Lewin, nevertheless has preserved the cool detachment of the true scientist and researcher in discussing controversial issues, such as the place of Moreno or Jung

in group psychotherapy, and particularly while refuting a large segment of that school of psychoanalysis, which, like the late Otto Fenichel, feels that only "for an analytic working through the situation of intimacy with the doctor alone seems indispensable." Yet, it is psychoanalysis, which, seemingly more than any other school of thought, has contributed to real progress in group psychotherapy, not only as evidenced by the late Paul Schilder, but by such recent contributions as those of Martin Grotjahn, Nathan Ackerman, Saul Scheidlinger, and S. R. Slavson. It also is evidence of Bach's scientific atmosphere that he refrains from hero worship whether he speaks of his own teacher, Kurt Lewin, or of such contemporaries as S. R. Slavson, Leary, Coffey, Maslow, Durkin, or Welch. Everybody simply has his place in one methodology, that of group psychotherapy, which unites them all.

This reviewer would like to raise one question pertaining to the selection of the writers. With the exception of two writers (who are psychiatrists), the other 22 contributors are clinical psychologists. It might have been appropriate for some of the progress in clinical psychology to be evaluated by representatives of other disciplines, even if in their points of view the progress in clinical psychology did not always appear to be as shiny as psychologists themselves like to believe.

All told, this second volume is not only a "must" for all psychologists regardless of their school of thought but also a rich experience for their colleagues in other disciplines, particularly in psychiatry and psychiatric social work.

HANS A. ILLING, PH. D.,
Los Angeles, Calif.

YEAR BOOK OF NEUROLOGY, PSYCHIATRY AND NEUROSURGERY (1955-1956 SERIES). Edited by *Roland P. Mackay, M.D.* (Neurology), *S. Bernard Wortis, M.D.* (Psychiatry), *Percival Bailey, M.D., and Oscar Sugar, M.D.* (Neurosurgery). (Chicago: The Year Book Publishers, 1956. $7.00.)

The editor of the neurology section notes that the "outstanding neurologic event of 1955, beyond all doubt," was the production of the polio vaccine. After public release, the use of vaccine from one laboratory had been followed by attacks of poliomyelitis in 79 children, of whom 11 died and three-fourths were paralyzed. There were also 125 contact cases. After testing methods were perfected no further complications occurred, and the Salk vaccine came into use in many countries. Mackay records that in the U.S. in 1955 the vaccine "was about 75% effective in preventing paralytic poliomyelitis among those vaccinated."

He also calls attention to continuing work on the functions of the temporal lobes, their reception of a variety of sensory impulses which evoke visceral circuits and would thus appear "to offer the dynamic for extrinsic behavior." Further, "the temporal lobes, and in particular their inferior and medial portions, become indispensable to memory, but not its sole repository."

Many valuable contributions to our knowledge of the degenerative diseases are also cited. Further studies of the convulsive disorders emphasize "that EEG patterns are not readily translatable into clinical terms. . . . The current lazy appeal to the EEG for the answer to all questions of diagnosis, prognosis and therapy is more than ever to be deprecated."

In introducing the psychiatric section, Wortis notes that the present period in psychiatric history is likely to be remembered as the era of psychopharmacology. While warning against the panacea obsession, he conservatively records that the newer drugs "are often remarkably helpful in the treatment of some neurotic and psychotic reactions."

Intensive work is being carried out in the field of experimental psychiatry—the production of psychosis-like reactions by ingestion of lysergic acid and related substances and their resolution by the use of other drugs.

"Advances . . . in the physical and pharmacologic therapies have done much to move psychiatry closer to medicine in its broadest and best application, and have also shown that the psychiatrist needs to be a physician with many skills, biologic, psychologic and social."

The editor forsees the advent of "newer and better anxiety- and tension-relieving drugs," the performance of "fewer total lobotomies," and more effective treatment by "newer electric and ultrasonic procedures."

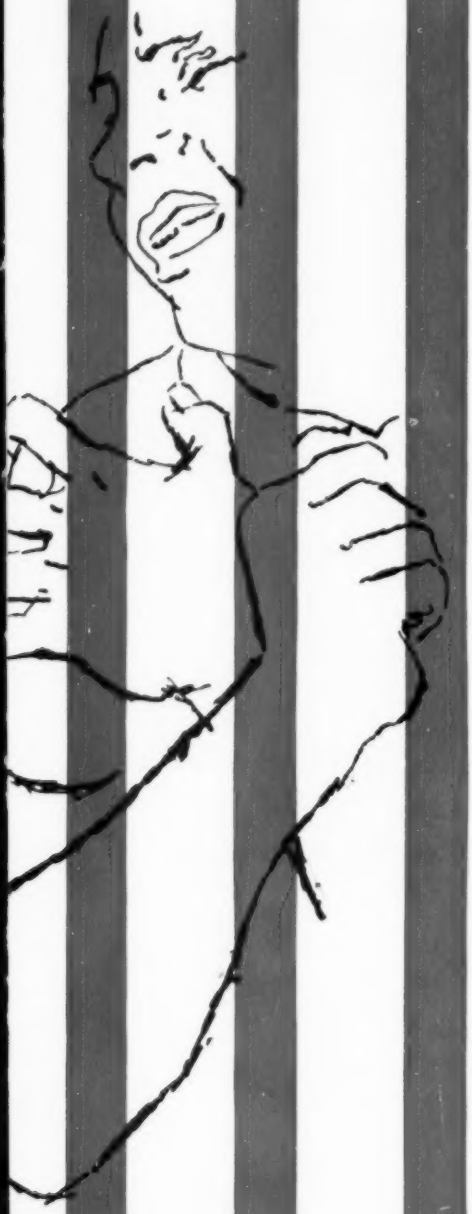
Bailey and Sugar, in their introduction to the section on neurosurgery, devote most of their remarks to severe criticism of the operation of lobotomy in the treatment of mental illness. They quote with approval the assaults on this procedure by the Belgian, J. Ley. They seem to accept this author's concession that there is only one justification for lobotomy—the relief of violent suffering, either moral or physical. They recall with emphasis the Hippocratic maxim, *Primum non nocere.*

Welcome is the finding that with the use of the newer drugs "the temptation to use it [lobotomy] early in the course of a mental illness has been practically eliminated."

Among other neurosurgical procedures the editors refer to temporal lobectomy introduced by Bailey and Gibbs for psychomotor epilepsy. These authors' warning against bilateral invasion of the medial part of the temporal lobe has not always been heeded—with disastrous results.

Since Cushing opened the doors to brain surgery, ever wider and deeper areas of that organ have been made accessible to remedial techniques or exposed to experimental interference. Bailey and Sugar sum it up: "By all means let us continue to search for new methods of alleviation of human ailments, but always mindful of our responsibilities as physicians."

C. B. F.



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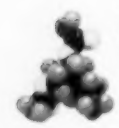

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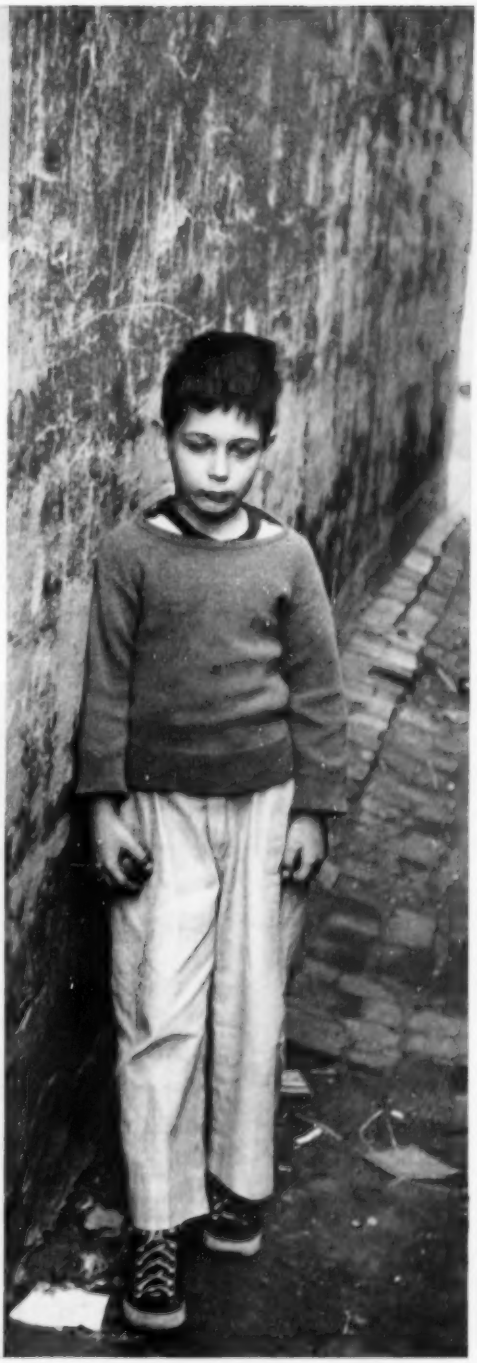

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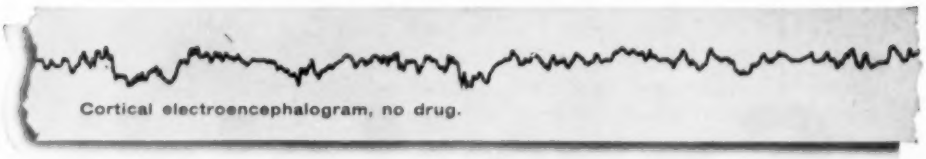
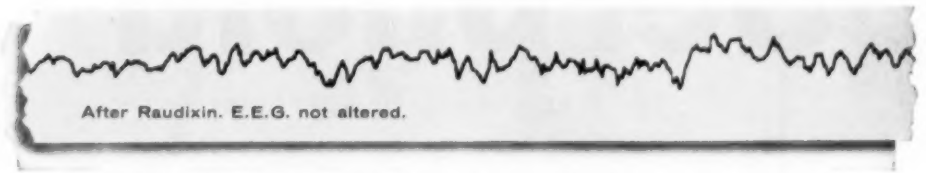


Cortical electroencephalogram, no drug.



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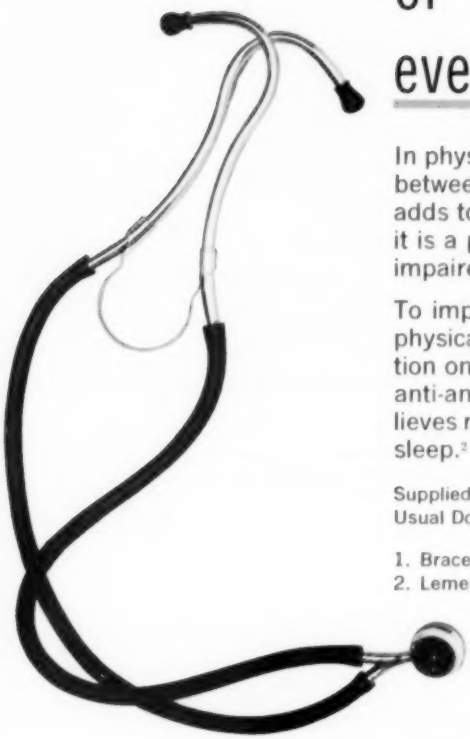

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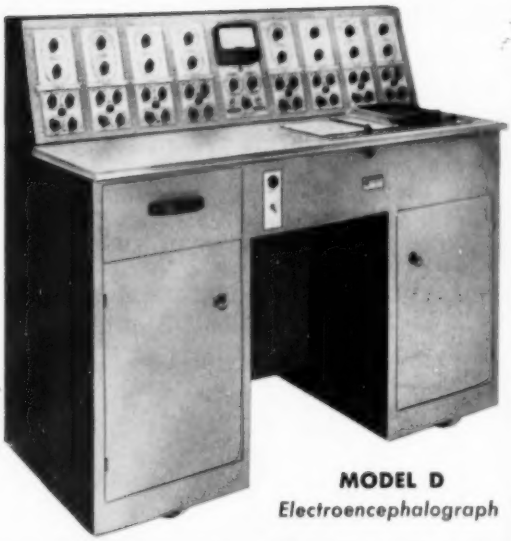

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